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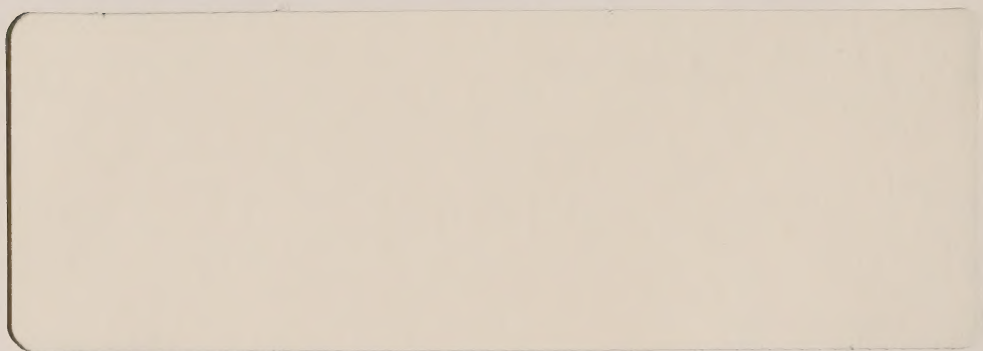
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de la technologie
et du stock de capital**

Survey of Manufacturing Technologies - 1989

Statistical Tables

Canada



Survey of Manufacturing Technologies - 1989

Statistical Tables

Science, Technology and Capital Stock Division
Statistics Canada

September 1989

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*** ERRATUM ***

Substitute the Tables 14, 15, 28 and 29 in
Survey of Manufacturing Technologies - 1989

ST-89-10

with the attached Tables

Remplacez les tableaux 14, 15, 28 et 29 du document
Enquête sur la technologie de la fabrication - 1989

ST-89-10

par les tableaux ci-joints

TABLE 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH													
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS				
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT				
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.				
IND														
1. FOOD, BEVERAGE AND TOBACCO	10	10	10	8	10	7	10	12	10	11				
2. RUBBER AND PLASTIC	6	7	8	12	7	5	5	5	10	10				
3. LEATHER, TEXTILE AND CLOTHING	4	5	5	7	7	6	5	12	6	5				
4. WOOD	10	11	11	7	6	5	4	7	4	5				
5. FURNITURE AND FIXTURE	3	2	3	3	2	4	4	4	3	3				
6. PAPER AND ALLIED PRODUCT	2	1	4	3	4	4	4	5	4	6				
7. PRINTING, PUBLISHING AND ALLIED	1	2	2	1	1	1	1	1	1	2				
8. PRIMARY METAL	3	10	10	7	7	6	9	12	9	9				
9. FABRICATED METAL PRODUCT	2	3	9	9	2	8	9	10	6	6				
10. MACHINERY	3	4	6	10	6	9	9	8	6	7				
11. TRANSPORTATION EQUIPMENT	4	4	5	7	5	12	7	7	6	6				
12. ELECTRICAL AND ELECTRONIC PRODUCTS	2	3	13	3	5	3	3	12	4	4				
13. NON-METALLIC MINERAL PRODUCTS	2	2	2	10	9	9	10	11	11	11				
14. PETROLEUM AND CHEMICALS	5	5	5	3	4	4	4	4	4	5				
15. OTHER MANUFACTURING	4	8	5	2	2	2	2	4	5	4				
TOTAL	4	5	6	6	5	5	6	7	5	6				

(CONTINUED)

TABLE 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A IAN T	5B IAN F	5C MAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	14	14	10	15	15	11	14	15	18	11	
2. RUBBER AND PLASTIC	7	7	7	10	7	7	8	8	12	7	
3. LEATHER, TEXTILE AND CLOTHING	6	10	7	5	6	6	5	4	5	6	
4. WOOD	3	7	11	11	11	10	10	13	15	12	
5. FURNITURE AND FIXTURE	3	4	4	4	4	4	3	2	2	7	
6. PAPER AND ALLIED PRODUCT	6	6	6	3	4	2	3	4	7	3	
7. PRINTING, PUBLISHING AND ALLIED	3	3	1	1	2	6	1	3	2	1	
8. PRIMARY METAL	10	9	6	7	11	4	8	6	10	12	
9. FABRICATED METAL PRODUCT	8	7	7	10	11	9	7	11	15	10	
10. MACHINERY	8	7	14	14	14	15	15	8	11	19	
11. TRANSPORTATION EQUIPMENT	8	8	7	13	9	7	7	4	7	9	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	3	5	3	7	2	3	2	6	3	
13. NON-METALLIC MINERAL PRODUCTS	11	10	13	12	13	11	12	11	15	12	
14. PETROLEUM AND CHEMICALS	4	9	3	4	5	3	4	4	6	4	
15. OTHER MANUFACTURING	7	8	1	5	6	6	5	1	2	2	
TOTAL	7	7	7	8	9	8	7	7	9	8	

(CONTINUED)

TABLE 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

IND	TECH		
	7B SCADA	7C AI/ES	
	PERCENT OF EST.	PERCENT OF EST.	
IND			
1. FOOD, BEVERAGE AND TOBACCO	12	13	
2. RUBBER AND PLASTIC	5	10	
3. LEATHER, TEXTILE AND CLOTHING	6	7	
4. WOOD	9	10	
5. FURNITURE AND FIXTURE	7	9	
6. PAPER AND ALLIED PRODUCT	5	11	
7. PRINTING, PUBLISHING AND ALLIED	1	5	
8. PRIMARY METAL	11	13	
9. FABRICATED METAL PRODUCT	7	11	
10. MACHINERY	15	21	
11. TRANSPORTATION EQUIPMENT	8	8	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	13	
13. NON-METALLIC MINERAL PRODUCTS	10	14	
14. PETROLEUM AND CHEMICALS	4	6	
15. OTHER MANUFACTURING	2	2	
TOTAL	6	9	

TABLE 15

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE OF OTHER REASONS,
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP									
	1. DESIGN AND ENGINEERING		2. FABRICATION AND ASSEMBLY		3. AUTOMATED MATERIAL HANDLING		4. AUTOMATED SENSOR BASED		5. COMMUNICATIONS AND CONTROL	
	PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.	
IND										
1. FOOD, BEVERAGE AND TOBACCO	11	12			11	15	17	18		17
2. RUBBER AND PLASTIC	8	15			10	7	15	12		10
3. LEATHER, TEXTILE AND CLOTHING	6	15			6	11	9	6		8
4. WOOD	12	9			5	7	16	17		14
5. FURNITURE AND FIXTURE	3	6			3	4	5	3		9
6. PAPER AND ALLIED PRODUCT	5	6			7	9	8	7		13
7. PRINTING, PUBLISHING AND ALLIED	2	2			2	3	7	3		5
8. PRIMARY METAL	10	16			10	10	12	10		16
9. FABRICATED METAL PRODUCT	11	16			6	8	14	16		15
10. MACHINERY	8	16			7	10	20	13		23
11. TRANSPORTATION EQUIPMENT	6	20			7	10	20	8		11
12. ELECTRICAL AND ELECTRONIC PRODUCTS	13	14			4	3	9	6		13
13. NON-METALLIC MINERAL PRODUCTS	3	13			12	11	17	16		16
14. PETROLEUM AND CHEMICALS	6	4			5	9	7	7		6
15. OTHER MANUFACTURING	9	6			5	8	9	2		2
TOTAL	7	11			6	8	12	10		11

TABLE 28

NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP
IND										
1. FOOD, BEVERAGE AND TOBACCO	6	8	9	7	8	9	9	13	10	12
2. RUBBER AND PLASTIC	4	6	7	9	9	11	12	13	8	7
3. LEATHER, TEXTILE AND CLOTHING	7	12	12	12	10	11	9	12	13	12
4. WOOD	8	9	10	8	9	9	8	10	8	12
5. FURNITURE AND FIXTURE	4	6	8	7	4	8	8	9	5	7
6. PAPER AND ALLIED PRODUCT	1	2	5	4	3	4	5	6	8	9
7. PRINTING, PUBLISHING AND ALLIED	2	11	12	5	8	4	4	5	4	11
8. PRIMARY METAL	4	11	17	8	6	16	21	23	24	21
9. FABRICATED METAL PRODUCT	5	7	9	8	6	20	10	12	10	16
10. MACHINERY	3	4	14	9	2	8	10	6	6	8
11. TRANSPORTATION EQUIPMENT	0	1	1	1	2	4	3	4	10	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	6	10	15	8	4	16	10	15	12	13
13. NON-METALLIC MINERAL PRODUCTS	2	6	5	4	4	4	9	12	5	4
14. PETROLEUM AND CHEMICALS	0	1	1	3	3	3	3	4	1	5
15. OTHER MANUFACTURING	2	6	7	5	4	6	7	4	7	5
TOTAL	3	6	7	6	5	8	8	9	9	10

(CONTINUED)

TABLE 28

NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP	OF SHIP
INDU										
1. FOOD, BEVERAGE AND TOBACCO	7	7	6	7	11	7	7	9	11	7
2. RUBBER AND PLASTIC	9	9	5	7	9	6	6	5	9	11
3. LEATHER, TEXTILE AND CLOTHING	10	11	8	8	13	9	7	8	9	13
4. WOOD	6	10	10	10	11	3	9	10	10	12
5. FURNITURE AND FIXTURE	9	9	9	8	9	10	9	4	5	9
6. PAPER AND ALLIED PRODUCT	7	4	5	3	7	1	2	7	11	6
7. PRINTING, PUBLISHING AND ALLIED	5	14	4	4	9	5	3	7	8	14
8. PRIMARY METAL	18	7	2	5	7	4	6	20	23	10
9. FABRICATED METAL PRODUCT	12	10	9	7	15	5	6	8	14	9
10. MACHINERY	8	7	7	10	10	8	8	9	11	19
11. TRANSPORTATION EQUIPMENT	2	3	2	16	3	1	3	4	6	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	8	11	6	5	7	6	4	12	13	10
13. NON-METALLIC MINERAL PRODUCTS	2	2	9	4	9	3	3	5	5	5
14. PETROLEUM AND CHEMICALS	1	2	3	3	4	1	1	2	6	2
15. OTHER MANUFACTURING	5	7	5	5	7	7	8	3	4	5
TOTAL	6	6	5	8	8	4	5	7	10	8

(CONTINUED)

TABLE 28

NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

IND		TECH		
		7B SCADA	7C AI/ES	
		PERCENT	PERCENT	
		OF SHIP	OF SHIP	
IND				
1.	FOOD, BEVERAGE AND TOBACCO	6	12	
2.	RUBBER AND PLASTIC	8	17	
3.	LEATHER, TEXTILE AND CLOTHING	10	14	
4.	WOOD	11	13	
5.	FURNITURE AND FIXTURE	10	13	
6.	PAPER AND ALLIED PRODUCT	7	14	
7.	PRINTING, PUBLISHING AND ALLIED	11	14	
8.	PRIMARY METAL	7	19	
9.	FABRICATED METAL PRODUCT	10	17	
10.	MACHINERY	18	23	
11.	TRANSPORTATION EQUIPMENT	4	5	
12.	ELECTRICAL AND ELECTRONIC PRODUCTS	9	21	
13.	NON-METALLIC MINERAL PRODUCTS	2	8	
14.	PETROLEUM AND CHEMICALS	1	5	
15.	OTHER MANUFACTURING	7	6	
TOTAL		7	12	

TABLE 29

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP FOR OTHER REASONS,
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP													
	1. DESIGN AND ENGINEERING		2. FABRICATION AND ASSEMBLY		3. AUTOMATED MATERIAL HANDLING		4. AUTOMATED SENSOR BASED		5. COMMUNICATIONS AND CONTROL		6. MANUFACTURING INFORMATION		7. INTEGRATION AND CONTROL	
	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.
IND														
1. FOOD, BEVERAGE AND TOBACCO	10		15		13		8		14		13		12	
2. RUBBER AND PLASTIC	8		19		8		11		14		9		21	
3. LEATHER, TEXTILE AND CLOTHING	13		19		14		13		18		10		16	
4. WOOD	10		14		12		11		15		12		16	
5. FURNITURE AND FIXTURE	8		13		7		9		14		6		14	
6. PAPER AND ALLIED PRODUCT	6		8		11		8		10		11		15	
7. PRINTING, PUBLISHING AND ALLIED	12		11		12		14		11		8		16	
8. PRIMARY METAL	17		30		29		18		9		25		22	
9. FABRICATED METAL PRODUCT	12		25		16		12		21		16		22	
10. MACHINERY	15		18		9		8		17		15		31	
11. TRANSPORTATION EQUIPMENT	1		7		11		3		19		6		6	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	17		24		14		11		15		15		22	
13. NON-METALLIC MINERAL PRODUCTS	6		15		7		2		16		7		10	
14. PETROLEUM AND CHEMICALS	2		5		6		2		8		7		6	
15. OTHER MANUFACTURING	9		10		7		7		10		6		8	
TOTAL	8		14		12		8		14		11		13	

Table of Contents

Table	Title
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1	The Technologies
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USE AND PLANNED USE OF TECHNOLOGY BY INDUSTRY

- | | |
|----|--|
| 2 | The use of technology by industry and 22 technologies (establishment weighted) |
| 3 | The use of at least one of the technologies in a technology group by industry (establishment weighted) |
| 4 | The plan to use technology within the next 2 years by industry and 22 technologies (establishment weighted) |
| 5 | The plan to use at least one of the technologies in a technology group within the next 2 years by industry (establishment weighted) |
| 6 | The plan to use technology within the next 2-5 years by industry and 22 technologies (establishment weighted) |
| 7 | The plan to use at least one of the technologies in a technology group within the next 2-5 years by industry (establishment weighted) |
| 8 | The planned use of technology (2 years and 2-5 years) by industry and 22 technologies (establishment weighted) |
| 9 | The planned use of at least one of the technologies in a technology group (2 years and 2-5 years) by industry (establishment weighted) |
| 10 | No plan to use technology because it does not apply by industry and 22 technologies (establishment weighted) |
| 11 | No plan to use at least one of the technologies in a technology group because it does not apply, by industry (establishment weighted) |
| 12 | No plan to use technology because not cost effective by industry and 22 technologies (establishment weighted) |
| 13 | No plan to use at least one of the technologies in a technology group because not cost effective by industry (establishment weighted) |

- 14 No plan to use technology because of other reasons by industry and 22 technologies (establishment weighted)
- 15 No plan to use at least one of the technologies in a technology group because of other reasons by industry (establishment weighted)
- 16 The use of technology by industry and 22 technologies (shipment weighted)
- 17 The use of at least one of the technologies in a technology group by industry (shipment weighted)
- 18 The plan to use technology within the next 2 years by industry and 22 technologies (shipment weighted)
- 19 The plan to use at least one of the technologies in a technology group within the next 2 years by industry and (shipment weighted)
- 20 The plan to use technology within the next 2-5 years by industry and 22 technologies (shipment weighted)
- 21 The plan to use at least one of the technologies in a technology group within the next 2-5 years by industry and (shipment weighted)
- 22 The planned use of technology (2 years and 2-5 years) by industry and 22 technologies (shipment weighted)
- 23 The planned use of at least one of the technologies in a technology group of technology (2 years and 2-5 years) by industry (shipment weighted)
- 24 No plan to use technology because it does not apply by industry and 22 technologies (shipment weighted)
- 25 No plan to use at least one of the technologies in a technology group because it does not apply, by industry (shipment weighted)
- 26 No plan to use technology because not cost effective by industry and 22 technologies (shipment weighted)
- 27 No plan to use at least one of the technologies in a technology group because not cost effective by industry (shipment weighted)
- 28 No plan to use technology because of other reasons by industry and 22 technologies (shipment weighted)
- 29 No plan to use at least one of the technologies in a technology group by industry (shipment weighted)

PROVINCIAL DIFFERENCES IN USE

- 30 The use of technology by province and 22 technologies
(establishment weighted)
- 31 The use of at least one of the technologies in a technology
group technology by province (establishment weighted)
- 32 The use of at least one of the 22 technologies by industry and
province (establishment weighted)
- 33 The use of at least one of the 17 technologies by industry and
province (establishment weighted)
- 34 The use of technology by province and 22 technologies
(shipment weighted)
- 35 The use of at least one of the technologies in a technology
group technology by province (shipment weighted)
- 36 The use of at least one of the 22 technologies by industry and
province (shipment weighted)
- 37 The use of at least one of the 17 technologies by industry and
province (shipment weighted)

CHARACTERISTICS OF ESTABLISHMENT

- 38 For goods of own manufacture, what was the percentage of the value of shipments exported from this plant in the last year? (establishment weighted)
- 39 Where is most of the research and development work done for this plant? (establishment weighted)
- 40 Where is most of the formal training done for your staff in this plant? (establishment weighted)
- 41 How difficult has it been to hire skilled personnel to work with the technologies used in this plant? (establishment weighted)
- 42 For those technologies in SECTION A that are used in this plant, have any been modified to improve their output? (establishment weighted)
- 43 For goods of own manufacture, what was the percentage of the value of shipments exported from this plant in the last year? (shipment weighted)
- 44 Where is most of the research and development work done for this plant? (shipment weighted)
- 45 Where is most of the formal training done for your staff in this plant? (shipment weighted)
- 46 How difficult has it been to hire skilled personnel to work with the technologies used in this plant? (shipment weighted)
- 47 For those technologies in SECTION A that are used in this plant, have any been modified to improve their output? (shipment weighted)

ANNEXES

- A Survey of Manufacturing Technologies - Survey form
- B Definition of terms for section A of questionnaire

Table 1. The technologies
Tableau 1. Les technologies

Technology Group	Technology
Groupe technologique	Technologie
1. Design and engineering Conception et ingénierie	
1.1	Computer aided design (CAD) and/or computer aided engineering (CAE) Conception assistée par ordinateur (CAO) et/ou ingénierie assistée par ordinateur (IAO)
1.2	CAD output used to control manufacturing machines (CAD/CAM) Résultats CAO servant au contrôle des machines de fabrication (CAO/FAO)
1.3	Digital representation of CAD output used in procurement activities Représentation numérique des résultats CAO servant au service des achats
2. Fabrication and assembly Fabrication et assemblage	
2.1	Flexible manufacturing cell(s) (FMC) or systems (FMS) Cellule(s) ou système de fabrication flexible (CFF) (SFF)
2.2	NC/CNC machine(s) Machines CN/CNI
2.3	Materials working laser(s) Laser servant à la fabrication de matériel
2.4	Pick and place robot(s) Robots de mise en place
2.5	Other robots Autres robots
3. Automated material handling Manipulation automatisée du matériel	
3.1	Automated storage and retrieval system (AS/RS) Système de stockage et d'extraction automatisé (SSEA)
3.2	Automated guided vehicle systems (AGVS) Système de véhicules guidés automatiques (SVGA)

4. Automated sensor based inspection

and/or testing equipment

Matériel d'inspection, de détection et de tests
informatiques

- 4.1 Performed on incoming or in process materials
Utilisation aux étapes de l'entrée ou dans le
procédé de fabrication
- 4.2 Performed on final product
Exécution sur le produit final

5. Communications and control

Communications et contrôle

- 5.1 Local area network for technical data
Réseau local pour les données techniques
- 5.2 Local area network for factory use
Réseau local pour l'usine
- 5.3 Inter-company computer network linking
plant to subcontractors.
Réseau informatique entre entreprises reliant
les usines aux sous-contractants, fournisseurs
ou clients
- 5.4 Programmable controller(s)
Contrôleurs programmables
- 5.5 Computer(s) used for control on the factory floor
Ordinateurs servant au contrôle dans le procédé
de fabrication

6. Manufacturing information systems

Système d'information relatif à la fabrication

- 6.1 Materials Requirement Planning (MRP)
Planification des besoins matières (PBM)
- 6.2 Manufacturing Resource Planning (MRP II)
Planification des ressources en fabrication
(PBM II)

7. Integration and control

Contrôle et intégration

- 7.1 Computer integrated manufacturing (CIM)
Fabrication intégrée par ordinateur (FIO)
- 7.2 Supervisory control and data acquisition (SCADA)
Contrôle et acquisition des données de production
(CADP)
- 7.3 Artificial intelligence and/or expert systems
Intelligence artificielle et/ou systèmes experts

TABLE 2

THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH													
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B MC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS				
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND														
1. FOOD, BEVERAGE AND TOBACCO	14	3	2	11	7	1	3	3	5	2				
2. RUBBER AND PLASTIC	10	3	2	10	8	0	7	3	6	3				
3. LEATHER, TEXTILE AND CLOTHING	10	7	4	6	14	2	2	3	4	2				
4. WOOD	13	8	7	9	7	3	4	3	4	5				
5. FURNITURE AND FIXTURE	7	4	2	4	7	1	1	1	1	1				
6. PAPER AND ALLIED PRODUCT	27	5	4	7	11	3	3	7	10	4				
7. PRINTING, PUBLISHING AND ALLIED	14	3	2	1	12	6	0	3	6	0				
8. PRIMARY METAL	28	7	4	14	20	1	10	6	4	4				
9. FABRICATED METAL PRODUCT	21	11	5	7	25	0	5	1	1	4				
10. MACHINERY	36	12	4	13	35	1	4	5	3	2				
11. TRANSPORTATION EQUIPMENT	34	17	13	13	19	1	13	12	9	3				
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	9	6	9	18	5	9	2	1	1				
13. NON-METALLIC MINERAL PRODUCTS	11	7	7	12	13	1	3	1	14	7				
14. PETROLEUM AND CHEMICALS	18	4	4	6	3	0	3	1	8	2				
15. OTHER MANUFACTURING	7	3	1	5	9	0	1	2	1	0				
TOTAL	17	7	4	7	14	2	3	3	4	2				

(CONTINUED)

TABLE 2
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	14	12	16	14	9	30	19	23	8	2	
2. RUBBER AND PLASTIC	5	9	8	6	10	31	17	17	9	3	
3. LEATHER, TEXTILE AND CLOTHING	4	3	12	6	9	6	7	17	13	4	
4. WOOD	12	10	10	8	16	23	15	8	9	1	
5. FURNITURE AND FIXTURE	5	5	4	7	6	12	7	25	6	2	
6. PAPER AND ALLIED PRODUCT	25	30	22	22	16	44	32	24	16	12	
7. PRINTING, PUBLISHING AND ALLIED	6	3	8	2	3	10	2	10	6	5	
8. PRIMARY METAL	15	20	21	20	18	47	32	25	13	14	
9. FABRICATED METAL PRODUCT	8	8	12	13	9	14	11	17	12	8	
10. MACHINERY	3	6	17	9	5	16	9	17	13	2	
11. TRANSPORTATION EQUIPMENT	23	21	21	18	45	29	26	33	13	4	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	15	14	18	12	15	20	19	29	20	5	
13. NON-METALLIC MINERAL PRODUCTS	9	12	7	14	7	23	12	17	11	5	
14. PETROLEUM AND CHEMICALS	9	8	19	16	19	33	22	32	18	10	
15. OTHER MANUFACTURING	7	7	2	3	7	7	3	11	4	1	
TOTAL	9	8	11	9	10	18	12	17	10	4	

(CONTINUED)

TABLE 2
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF EST.	PERCENT OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	9	0
2. RUBBER AND PLASTIC	6	0
3. LEATHER, TEXTILE AND CLOTHING	5	2
4. WOOD	8	0
5. FURNITURE AND FIXTURE	7	1
6. PAPER AND ALLIED PRODUCT	19	4
7. PRINTING, PUBLISHING AND ALLIED	5	0
8. PRIMARY METAL	16	3
9. FABRICATED METAL PRODUCT	5	6
10. MACHINERY	10	0
11. TRANSPORTATION EQUIPMENT	7	0
12. ELECTRICAL AND ELECTRONIC PRODUCTS	6	1
13. NON-METALLIC MINERAL PRODUCTS	9	2
14. PETROLEUM AND CHEMICALS	15	3
15. OTHER MANUFACTURING	0	0
TOTAL	6	2

TABLE 3
THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN THE
TECHNOLOGY GROUPS, BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING PERCENT OF EST.	2. FABRICATION AND ASSEMBLY PERCENT OF EST.	3. AUTOMATED MATERIAL HANDLING PERCENT OF EST.	4. AUTOMATED SENSOR BASED PERCENT OF EST.	5. COMMUNICATIONS AND CONTROL PERCENT OF EST.	6. MANUFACTURING INFORMATION PERCENT OF EST.	7. INTEGRATION AND CONTROL PERCENT OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	15	15	7	15	40	24	10
2. RUBBER AND PLASTIC	12	17	8	12	36	18	8
3. LEATHER, TEXTILE AND CLOTHING	13	20	4	5	19	18	6
4. WOOD	20	15	8	13	35	11	6
5. FURNITURE AND FIXTURE	8	11	2	5	15	25	8
6. PAPER AND ALLIED PRODUCT	28	19	12	33	52	25	21
7. PRINTING, PUBLISHING AND ALLIED	16	18	7	8	19	10	9
8. PRIMARY METAL	30	36	8	22	59	27	23
9. FABRICATED METAL PRODUCT	23	28	4	8	30	17	13
10. MACHINERY	37	42	5	6	28	19	11
11. TRANSPORTATION EQUIPMENT	37	46	12	31	58	34	9
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	23	1	18	42	30	11
13. NON-METALLIC MINERAL PRODUCTS	16	20	16	14	31	19	11
14. PETROLEUM AND CHEMICALS	20	10	9	13	45	33	18
15. OTHER MANUFACTURING	9	14	1	10	16	11	1
TOTAL	19	21	6	11	30	18	9

TABLE 4
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH													
	1A CAD/CAE		1B CAD/CAM		1C CAD PROC		2A FMC/S		2B NC/CNC		2C LASER		2D ROBOT PP	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND														
1. FOOD, BEVERAGE AND TOBACCO	1	3		4	1	1	1	0	0	1			2	0
2. RUBBER AND PLASTIC	9	1		5	1	0	1	1	1	4	4	1	1	0
3. LEATHER, TEXTILE AND CLOTHING	7	6		6	1	1	1	0	0	2	1	1	1	0
4. WOOD	5	3		2	1	1	0	1	1	1	2	3	0	0
5. FURNITURE AND FIXTURE	9	6		3	6	5	4	4	4	8	1	0	4	2
6. PAPER AND ALLIED PRODUCT	8	3	3	3	1	3	1	1	1	2	1	5	2	0
7. PRINTING, PUBLISHING AND ALLIED	1	0	0	0	0	0	0	0	1	0	0	0	0	0
8. PRIMARY METAL	4	3	3			3	1	1	2	2	2	7	1	1
9. FABRICATED METAL PRODUCT	11	11	8	1	1	1	6	0	4	0	4	0	0	0
10. MACHINERY	7	5	3	3	1	6	2	2	1	2	2	2	0	0
11. TRANSPORTATION EQUIPMENT	9	11	10		7	7	9	16	3	2	8			
12. ELECTRICAL AND ELECTRONIC PRODUCTS	16	6	4	1	1	1	1	1	1	2	5	4	0	0
13. NON METALLIC MINERAL PRODUCTS	3	2	1	1	1	1	1	1	1	1	0	1	1	1
14. PETROLEUM AND CHEMICALS	3	1	2	1	1	5	1	1	2	1	2	1	4	4
15. OTHER MANUFACTURING	3	1	1	1	1	0	0	0	0	1	1	1	1	1
TOTAL	6	5	4	1	1	2	2	2	2	2	2	1	1	1

(CONTINUED)

TABLE 4
THE PLAN 10 USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH											
	4A TEST P		4B TEST F		5A LAN T		5B LAN F		5C WAN		5D PROG C	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND												
1. FOOD, BEVERAGE AND TOBACCO	5	5	7	9	6	2	9	11	14	10		
2. RUBBER AND PLASTIC	2	2	5	8	4	3	10	13	9	2		
3. LEATHER, TEXTILE AND CLOTHING	6	6	7	9	2	1	5	8	8	2		
4. WOOD	2	3	4	4	4	1	4	13	7	1		
5. FURNITURE AND FIXTURE	5	1	6	8	2	2	7	9	16	5		
6. PAPER AND ALLIED PRODUCT	8	8	15	11	6	9	10	28	22	8		
7. PRINTING, PUBLISHING AND ALLIED	0	0	2	2	8	0	2	14	3	1		
8. PRIMARY METAL	2	2	5	7	10	2	7	16	21	3		
9. FABRICATED METAL PRODUCT	1	2	4	5	2	3	7	6	5	2		
10. MACHINERY	3	2	3	6	3	1	8	22	15	2		
11. TRANSPORTATION EQUIPMENT	17	4	17	24	2	7	15	20	25	14		
12. ELECTRICAL AND ELECTRONIC PRODUCTS	1	4	11	16	11	8	13	20	21	2		
13. NON-METALLIC MINERAL PRODUCTS	4	1	4	5	4	2	5	7	7	2		
14. PETROLEUM AND CHEMICALS	4	4	6	6	9	5	9	8	5	2		
15. OTHER MANUFACTURING	1	1	2	1	1	1	2	8	7	1		
TOTAL	3	3	5	6	4	2	6	12	9	3		

(CONTINUED)

TABLE 4

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF EST.	PERCENT OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	7	3
2. RUBBER AND PLASTIC	4	1
3. LEATHER, TEXTILE AND CLOTHING	4	2
4. WOOD	2	0
5. FURNITURE AND FIXTURE	7	0
6. PAPER AND ALLIED PRODUCT	7	5
7. PRINTING, PUBLISHING AND ALLIED	0	0
8. PRIMARY METAL	2	1
9. FABRICATED METAL PRODUCT	9	1
10. MACHINERY	2	0
11. TRANSPORTATION EQUIPMENT	16	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	5	1
13. NON-METALLIC MINERAL PRODUCTS	4	2
14. PETROLEUM AND CHEMICALS	4	2
15. OTHER MANUFACTURING	1	0
TOTAL	5	1

TABLE 5
THE PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2 YEARS.
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

IND	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
1. FOOD, BEVERAGE AND TOBACCO	6	2	2	6	17	15	16
2. RUBBER AND PLASTIC	14	9	1	3	18	17	5
3. LEATHER, TEXTILE AND CLOTHING	8	4	1	6	13	9	6
4. WOOD	8	4	3	4	9	14	3
5. FURNITURE AND FIXTURE	10	15	4	6	10	22	11
6. PAPER AND ALLIED PRODUCT	9	7	7	9	30	31	13
7. PRINTING, PUBLISHING AND ALLIED	2	2	0	0	11	15	1
8. PRIMARY METAL	6	8	7	3	22	25	4
9. FABRICATED METAL PRODUCT	16	12	1	2	14	8	10
10. MACHINERY	13	9	2	3	16	26	3
11. TRANSPORTATION EQUIPMENT	20	24	8	18	29	29	17
12. ELECTRICAL AND ELECTRONIC PRODUCTS	20	8	4	5	30	26	7
13. NON-METALLIC MINERAL PRODUCTS	6	4	1	4	12	9	6
14. PETROLEUM AND CHEMICALS	4	8	4	4	24	12	7
15. OTHER MANUFACTURING	4	2	-	1	4	10	1
TOTAL	9	7	2	4	14	15	7

TABLE 6

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH													
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTM	3A AS/RS	3B AGVS				
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND														
1. FOOD, BEVERAGE AND TOBACCO	1	1	1	1	1	0	2	4	7	5				
2. RUBBER AND PLASTIC	8	6	8	3	1	1	4	4	6	2				
3. LEATHER, TEXTILE AND CLOTHING	4	3	3	3	2	1	2	1	1	2				
4. WOOD	6	2	3	1	1	1	1	1	5	1				
5. FURNITURE AND FIXTURE	2	4	7	3	2	2	2	3	1	1				
6. PAPER AND ALLIED PRODUCT	5	8	4	6	3	2	7	7	12	9				
7. PRINTING, PUBLISHING AND ALLIED	5	0	0	1	1	1	0	0	1	0				
8. PRIMARY METAL	6	8	3	4	5	3	4	3	4	3				
9. FABRICATED METAL PRODUCT	8	7	3	1	6	3	2	3	2	1				
10. MACHINERY	14	16	12	6	2	2	3	2	1	0				
11. TRANSPORTATION EQUIPMENT	14	10	10	2	9	8	3	11	3	2				
12. ELECTRICAL AND ELECTRONIC PRODUCTS	7	14	15	4	1	5	11	5	3	5				
13. NON-METALLIC MINERAL PRODUCTS	10	2	1	4	3	1	3	2	4	4				
14. PETROLEUM AND CHEMICALS	3	4	5	3	1	1	3	4	4	3				
15. OTHER MANUFACTURING	6	6	5	2	5	1	1	2	1	0				
TOTAL	6	5	4	2	3	2	2	3	3	2				

(CONTINUED)

TABLE 6
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	8	9	6	6	7	3	6	8	8	8	
2. RUBBER AND PLASTIC	5	7	7	7	6	2	9	12	12	13	
3. LEATHER, TEXTILE AND CLOTHING	2	2	2	3	4	2	3	8	8	7	
4. WOOD	6	2	6	6	3	2	5	9	11	2	
5. FURNITURE AND FIXTURE	2	1	1	1	6	6	2	8	12	7	
6. PAPER AND ALLIED PRODUCT	9	5	2	6	9	1	6	10	11	5	
7. PRINTING, PUBLISHING AND ALLIED	1	1	1	1	6	2	6	4	7	1	
8. PRIMARY METAL	1	2	6	8	6	.	3	4	6	3	
9. FABRICATED METAL PRODUCT	5	5	17	10	12	6	8	10	10	8	
10. MACHINERY	0	1	11	8	5	3	6	9	12	8	
11. TRANSPORTATION EQUIPMENT	10	9	11	3	7	4	5	9	10	14	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	8	5	13	15	15	10	15	16	16	17	
13. NON-METALLIC MINERAL PRODUCTS	6	7	4	2	3	3	4	5	5	4	
14. PETROLEUM AND CHEMICALS	7	4	7	8	9	4	10	12	15	3	
15. OTHER MANUFACTURING	1	1	4	2	4	4	11	6	4	1	
TOTAL	4	4	7	5	7	4	7	8	9	5	

(CONTINUED)

TABLE 6

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF EST.	PERCENT OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	3	3
2. RUBBER AND PLASTIC	11	3
3. LEATHER, TEXTILE AND CLOTHING	8	6
4. WOOD	4	1
5. FURNITURE AND FIXTURE	3	1
6. PAPER AND ALLIED PRODUCT	13	7
7. PRINTING, PUBLISHING AND ALLIED	2	5
8. PRIMARY METAL	10	8
9. FABRICATED METAL PRODUCT	6	2
10. MACHINERY	5	3
11. TRANSPORTATION EQUIPMENT	5	3
12. ELECTRICAL AND ELECTRONIC PRODUCTS	14	6
13. NON-METALLIC MINERAL PRODUCTS	4	4
14. PETROLEUM AND CHEMICALS	11	5
15. OTHER MANUFACTURING	1	1
TOTAL	5	3

TABLE 7
THE PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2-5 YEARS,
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	2	6	10	9	16	11	8
2. RUBBER AND PLASTIC	13	9	6	8	15	18	18
3. LEATHER, TEXTILE AND CLOTHING	6	5	2	3	7	9	9
4. WOOD	7	3	5	7	12	13	6
5. FURNITURE AND FIXTURE	9	7	2	2	8	13	7
6. PAPER AND ALLIED PRODUCT	12	14	14	9	18	15	15
7. PRINTING, PUBLISHING AND ALLIED	6	2	1	1	12	6	6
8. PRIMARY METAL	13	15	5	2	13	8	18
9. FABRICATED METAL PRODUCT	14	12	2	5	24	14	11
10. MACHINERY	30	12	1	2	19	13	15
11. TRANSPORTATION EQUIPMENT	18	29	4	12	19	11	15
12. ELECTRICAL AND ELECTRONIC PRODUCTS	29	14	7	11	30	23	24
13. NON-METALLIC MINERAL PRODUCTS	11	8	5	8	12	7	9
14. PETROLEUM AND CHEMICALS	6	6	5	8	18	17	15
15. OTHER MANUFACTURING	9	7	1	2	15	7	2
TOTAL	10	8	4	5	16	12	10

TABLE 8
THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH													
	1A CAD/CAE		1B CAD/CAM		1C CAD PROC		2A FMC/S		2B NC/CNC		2C LASER		2D ROBOT PP	
	PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.	
1MD														
1. FOOD, BEVERAGE AND TOBACCO	3		5		5		2		2		1		3	
2. RUBBER AND PLASTIC	17		7		12		4		2		2		7	
3. LEATHER, TEXTILE AND CLOTHING	11		8		9		3		3		1		4	
4. WOOD	11		5		5		1		1		1		2	
5. FURNITURE AND FIXTURE	11		10		9		8		7		6		7	
6. PAPER AND ALLIED PRODUCT	12		11		7		8		6		3		9	
7. PRINTING, PUBLISHING AND ALLIED	7		1		1		1		1		2		1	
8. PRIMARY METAL	10		10		6		4		9		4		6	
9. FABRICATED METAL PRODUCT	19		19		11		2		8		9		3	
10. MACHINERY	22		21		15		7		8		4		4	
11. TRANSPORTATION EQUIPMENT	23		21		20		9		16		17		18	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	23		20		19		5		1		6		13	
13. NON METALLIC MINERAL PRODUCTS	13		4		2		5		4		1		4	
14. PETROLEUM AND CHEMICALS	6		5		6		4		6		2		4	
15. OTHER MANUFACTURING	10		8		6		2		5		1		2	
TOTAL	12		10		8		3		4		4		4	

(CONTINUED)

TABLE 9
THE PLANNED USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP (2 YEARS OR 2-5 YEARS)
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	8	7	12	15	27	28	23
2. RUBBER AND PLASTIC	24	16	7	10	28	30	21
3. LEATHER, TEXTILE AND CLOTHING	13	9	3	9	19	18	14
4. WOOD	15	6	7	10	18	26	8
5. FURNITURE AND FIXTURE	14	20	6	8	12	30	14
6. PAPER AND ALLIED PRODUCT	20	19	21	18	39	43	26
7. PRINTING, PUBLISHING AND ALLIED	8	3	1	1	22	19	7
8. PRIMARY METAL	19	20	11	5	29	32	21
9. FABRICATED METAL PRODUCT	28	23	3	7	35	19	17
10. MACHINERY	39	20	3	4	32	35	17
11. TRANSPORTATION EQUIPMENT	37	39	12	29	46	39	31
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	20	11	16	53	44	26
13. NON-METALLIC MINERAL PRODUCTS	17	10	7	12	18	14	12
14. PETROLEUM AND CHEMICALS	10	12	8	13	32	25	20
15. OTHER MANUFACTURING	12	9	1	3	19	16	3
TOTAL	18	13	5	9	26	24	15

TABLE 10

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH											
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS		
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND												
1. FOOD, BEVERAGE AND TOBACCO	68	73	76	74	78	86	75	73	60	66		
2. RUBBER AND PLASTIC	58	76	70	67	73	86	67	74	61	68		
3. LEATHER, TEXTILE AND CLOTHING	55	67	66	64	61	65	72	68	73	67		
4. WOOD	58	65	68	68	71	84	74	72	67	74		
5. FURNITURE AND FIXTURE	68	72	77	78	76	82	84	81	84	81		
6. PAPER AND ALLIED PRODUCT	55	75	76	73	71	82	75	70	51	63		
7. PRINTING, PUBLISHING AND ALLIED	73	90	90	90	80	85	90	86	83	89		
8. PRIMARY METAL	51	67	71	68	56	84	68	89	60	69		
9. FABRICATED METAL PRODUCT	54	59	68	75	58	71	74	68	76	75		
10. MACHINERY	29	47	61	52	36	64	60	60	63	89		
11. TRANSPORTATION EQUIPMENT	36	50	54	59	48	62	50	57	85	61		
12. ELECTRICAL AND ELECTRONIC PRODUCTS	25	49	46	53	53	64	45	50	52	54		
13. NON METALLIC MINERAL PRODUCTS	70	81	77	69	70	83	76	78	62	89		
14. PETROLEUM AND CHEMICALS	66	82	80	84	83	90	80	83	71	80		
15. OTHER MANUFACTURING	73	75	82	86	80	90	89	87	81	84		
TOTAL	59	70	73	73	68	79	75	74	72	74		

(CONTINUED)

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH																			
	4A TEST P		4B TEST F		5A LAN T		5B LAN F		5C WAN		5D PROG C		5E COMP C		6A MRP		6B MRP II		7A CIM	
	PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.		PERCENT OF EST.	
IND																				
1. FOOD, BEVERAGE AND TOBACCO	47		50		57		49		53		46		43		36		47		61	
2. RUBBER AND PLASTIC	69		65		63		59		59		52		48		43		51		63	
3. LEATHER, TEXTILE AND CLOTHING	89		67		59		57		55		61		56		49		51		83	
4. WOOD	63		65		65		66		60		60		61		47		51		68	
5. FURNITURE AND FIXTURE	78		81		81		72		74		69		72		54		61		71	
6. PAPER AND ALLIED PRODUCT	49		47		51		53		57		36		41		25		32		80	
7. PRINTING, PUBLISHING AND ALLIED	82		87		87		91		71		80		86		64		76		87	
8. PRIMARY METAL	58		53		49		47		47		41		43		43		42		53	
9. FABRICATED METAL PRODUCT	89		69		55		55		57		62		58		49		51		64	
10. MACHINERY	70		65		44		49		56		57		51		41		43		56	
11. TRANSPORTATION EQUIPMENT	37		52		37		37		30		41		41		31		42		51	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	44		48		47		48		43		49		42		28		32		59	
13. NON-METALLIC MINERAL PRODUCTS	65		65		68		63		67		57		61		56		57		71	
14. PETROLEUM AND CHEMICALS	71		71		60		62		53		52		52		40		52		75	
15. OTHER MANUFACTURING	75		75		84		82		77		78		74		71		76		84	
TOTAL	67		68		64		64		60		61		60		50		55		69	

(CONTINUED)

TABLE 10

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA PERCENT OF EST.	7C AI/ES PERCENT OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	59	71
2. RUBBER AND PLASTIC	60	71
3. LEATHER, TEXTILE AND CLOTHING	54	66
4. WOOD	65	74
5. FURNITURE AND FIXTURE	69	80
6. PAPER AND ALLIED PRODUCT	46	62
7. PRINTING, PUBLISHING AND ALLIED	86	85
8. PRIMARY METAL	52	65
9. FABRICATED METAL PRODUCT	61	64
10. MACHINERY	59	60
11. TRANSPORTATION EQUIPMENT	54	58
12. ELECTRICAL AND ELECTRONIC PRODUCTS	55	59
13. NON-METALLIC MINERAL PRODUCTS	67	74
14. PETROLEUM AND CHEMICALS	61	78
15. OTHER MANUFACTURING	85	89
TOTAL	66	72

TABLE 11
NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT DOES NOT APPLY,
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

IND	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
1. FOOD, BEVERAGE AND TOBACCO	80	90	66	50	70	47	73
2. RUBBER AND PLASTIC	81	92	70	72	75	51	75
3. LEATHER, TEXTILE AND CLOTHING	71	79	77	72	70	52	72
4. WOOD	79	89	81	66	74	51	75
5. FURNITURE AND FIXTURE	77	92	86	83	85	61	81
6. PAPER AND ALLIED PRODUCT	81	91	66	51	88	33	68
7. PRINTING, PUBLISHING AND ALLIED	92	93	90	87	95	77	93
8. PRIMARY METAL	75	91	72	59	65	45	70
9. FABRICATED METAL PRODUCT	70	84	79	69	75	51	71
10. MACHINERY	62	76	72	71	89	44	64
11. TRANSPORTATION EQUIPMENT	55	75	70	52	57	43	61
12. ELECTRICAL AND ELECTRONIC PRODUCTS	58	74	57	52	65	33	68
13. NON-METALLIC MINERAL PRODUCTS	90	87	71	67	77	59	78
14. PETROLEUM AND CHEMICALS	86	92	84	74	74	52	82
15. OTHER MANUFACTURING	83	92	84	78	87	76	89
TOTAL	77	87	76	70	77	56	77

TABLE 12

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

IND	TECH													
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS				
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
1. FOOD, BEVERAGE AND TOBACCO	8	9	7	5	3	4	9	9	16	15				
2. RUBBER AND PLASTIC	8	6	8	8	11	8	14	10	17	17				
3. LEATHER, TEXTILE AND CLOTHING	20	12	16	20	16	25	17	15	15	24				
4. WOOD	8	11	8	14	15	7	17	14	18	15				
5. FURNITURE AND FIXTURE	12	12	9	7	7	8	5	4	11	10				
6. PAPER AND ALLIED PRODUCT	3	7	8	10	9	7	9	10	18	18				
7. PRINTING, PUBLISHING AND ALLIED	4	5	5	7	6	7	8	8	8	8				
8. PRIMARY METAL	8	7	9	7	8	5	7	7	16	15				
9. FABRICATED METAL PRODUCT	3	9	6	7	6	11	8	13	15	13				
10. MACHINERY	10	16	13	18	14	22	24	23	25	21				
11. TRANSPORTATION EQUIPMENT	4	8	8	12	13	8	11	11	14	22				
12. ELECTRICAL AND ELECTRONIC PRODUCTS	8	19	15	30	22	22	31	28	36	36				
13. NON METALLIC MINERAL PRODUCTS	5	6	12	5	4	5	8	7	9	9				
14. PETROLEUM AND CHEMICALS	5	5	4	4	4	4	8	8	12	8				
15. OTHER MANUFACTURING	6	6	6	5	4	7	6	5	12	11				
TOTAL	8	9	8	10	9	10	12	11	15	15				

(CONTINUED)

TABLE 12
NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH									
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND										
1. FOOD, BEVERAGE AND TOBACCO	11	10	3	7	11	8	9	7	6	9
2. RUBBER AND PLASTIC	11	9	8	9	13	4	8	8	8	13
3. LEATHER, TEXTILE AND CLOTHING	12	12	14	20	24	23	23	14	14	18
4. WOOD	14	14	5	5	5	5	5	9	7	16
5. FURNITURE AND FIXTURE	8	7	4	8	9	8	9	3	3	8
6. PAPER AND ALLIED PRODUCT	4	4	5	5	8	7	8	8	12	14
7. PRINTING, PUBLISHING AND ALLIED	8	6	2	2	9	2	3	5	6	5
8. PRIMARY METAL	13	14	12	12	6	5	7	5	7	14
9. FABRICATED METAL PRODUCT	10	10	5	8	9	7	9	7	7	10
10. MACHINERY	15	19	11	14	17	7	11	3	7	13
11. TRANSPORTATION EQUIPMENT	6	6	6	4	7	13	7	3	3	6
12. ELECTRICAL AND ELECTRONIC PRODUCTS	29	25	6	7	9	12	9	6	6	14
13. NON-METALLIC MINERAL PRODUCTS	7	5	3	4	5	4	6	4	5	6
14. PETROLEUM AND CHEMICALS	5	5	4	4	5	3	3	4	4	6
15. OTHER MANUFACTURING	7	7	7	7	5	6	6	4	7	11
TOTAL	10	10	6	8	10	8	9	6	7	11

(CONTINUED)

TABLE 12

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	78 SCADA	79 AI/ES
	PERCENT OF EST.	PERCENT OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	10	10
2. RUBBER AND PLASTIC	15	18
3. LEATHER, TEXTILE AND CLOTHING	24	16
4. WOOD	15	15
5. FURNITURE AND FIXTURE	8	9
6. PAPER AND ALLIED PRODUCT	11	12
7. PRINTING, PUBLISHING AND ALLIED	5	6
8. PRIMARY METAL	8	10
9. FABRICATED METAL PRODUCT	12	16
10. MACHINERY	8	15
11. TRANSPORTATION EQUIPMENT	11	22
12. ELECTRICAL AND ELECTRONIC PRODUCTS	17	19
13. NON-METALLIC MINERAL PRODUCTS	5	6
14. PETROLEUM AND CHEMICALS	5	6
15. OTHER MANUFACTURING	11	8
TOTAL	11	12

TABLE 13
NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT IS NOT COST EFFECTIVE.
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	10	12	17	11	17	8	12
2. RUBBER AND PLASTIC	11	19	19	12	18	8	20
3. LEATHER, TEXTILE AND CLOTHING	22	30	25	13	31	14	27
4. WOOD	15	23	21	14	6	9	18
5. FURNITURE AND FIXTURE	13	11	11	8	10	3	10
6. PAPER AND ALLIED PRODUCT	12	14	20	5	12	12	17
7. PRINTING, PUBLISHING AND ALLIED	6	10	8	8	11	6	6
8. PRIMARY METAL	11	11	16	14	16	7	17
9. FABRICATED METAL PRODUCT	10	21	15	10	11	7	18
10. MACHINERY	20	32	25	20	23	7	17
11. TRANSPORTATION EQUIPMENT	11	16	24	6	19	3	26
12. ELECTRICAL AND ELECTRONIC PRODUCTS	20	41	38	30	15	6	22
13. NON-METALLIC MINERAL PRODUCTS	14	10	10	7	8	5	7
14. PETROLEUM AND CHEMICALS	7	11	13	6	7	4	7
15. OTHER MANUFACTURING	7	9	12	8	8	7	12
TOTAL	12	18	17	11	14	8	15

TABLE 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH													
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS				
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND														
1. FOOD, BEVERAGE AND TOBACCO	10	10	10	8	10	7	10	12	10	11				
2. RUBBER AND PLASTIC	6	7	7	12	7	5	5	5	10	10				
3. LEATHER, TEXTILE AND CLOTHING	4	5	5	7	7	6	5	6	6	5				
4. WOOD	10	11	11	7	6	5	4	8	4	4				
5. FURNITURE AND FIXTURE	3	2	3	3	2	3	4	4	3	3				
6. PAPER AND ALLIED PRODUCT	2	1	4	3	4	4	4	5	4	5				
7. PRINTING, PUBLISHING AND ALLIED	1	2	2	1	1	1	1	1	1	1				
8. PRIMARY METAL	3	10	10	7	7	6	9	12	9	9				
9. FABRICATED METAL PRODUCT	2	3	9	9	2	8	9	10	6	6				
10. MACHINERY	3	4	6	10	5	8	8	7	6	6				
11. TRANSPORTATION EQUIPMENT	4	4	5	7	5	6	7	7	8	8				
12. ELECTRICAL AND ELECTRONIC PRODUCTS	2	3	12	3	5	3	3	11	4	4				
13. NON METALLIC MINERAL PRODUCTS	2	2	2	10	9	9	10	10	11	10				
14. PETROLEUM AND CHEMICALS	5	5	5	3	4	4	4	4	4	5				
15. OTHER MANUFACTURING	4	8	5	2	2	2	2	2	5	4				
TOTAL	4	5	6	6	4	5	6	6	5	5				

(CONTINUED)

TABLE 14
NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	8A MRP	8B MRP II	7A CIM	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	14	14	10	13	13	11	13	15	18	9	
2. RUBBER AND PLASTIC	7	7	7	10	7	7	6	8	12	7	
3. LEATHER, TEXTILE AND CLOTHING	6	9	5	5	6	6	5	4	5	6	
4. WOOD	3	7	11	11	11	10	9	13	15	12	
5. FURNITURE AND FIXTURE	3	4	4	4	3	4	3	2	2	7	
6. PAPER AND ALLIED PRODUCT	6	5	4	3	4	2	3	4	7	3	
7. PRINTING, PUBLISHING AND ALLIED	3	3	1	1	2	6	1	3	2	1	
8. PRIMARY METAL	10	9	6	7	11	4	8	6	9	12	
9. FABRICATED METAL PRODUCT	7	7	7	10	11	9	7	10	15	10	
10. MACHINERY	8	6	14	14	14	15	15	8	11	19	
11. TRANSPORTATION EQUIPMENT	6	8	7	13	7	7	7	4	7	9	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	3	5	3	7	2	3	2	6	3	
13. NON-METALLIC MINERAL PRODUCTS	11	10	12	12	13	10	12	11	12	12	
14. PETROLEUM AND CHEMICALS	4	7	3	4	5	3	4	4	4	4	
15. OTHER MANUFACTURING	7	7	1	5	6	5	5	1	2	2	
TOTAL	6	7	6	8	8	8	7	7	9	7	

(CONTINUED)

TABLE 14

NO PLAN TO USE TECHNOLOGY BECAUSE OF OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF EST.	PERCENT OF EST.
IND		
1. FOOD, BEVERAGE AND TOBACCO	12	13
2. RUBBER AND PLASTIC	5	9
3. LEATHER, TEXTILE AND CLOTHING	6	7
4. WOOD	9	10
5. FURNITURE AND FIXTURE	7	9
6. PAPER AND ALLIED PRODUCT	5	10
7. PRINTING, PUBLISHING AND ALLIED	1	5
8. PRIMARY METAL	11	13
9. FABRICATED METAL PRODUCT	7	11
10. MACHINERY	15	21
11. TRANSPORTATION EQUIPMENT	8	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	13
13. NON-METALLIC MINERAL PRODUCTS	10	11
14. PETROLEUM AND CHEMICALS	4	6
15. OTHER MANUFACTURING	2	2
TOTAL	6	9

TABLE 15
NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE OF OTHER REASONS,
BY INDUSTRY
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	11	12	11	14	15	18	17
2. RUBBER AND PLASTIC	8	15	10	7	13	12	10
3. LEATHER, TEXTILE AND CLOTHING	6	8	6	10	8	5	7
4. WOOD	12	9	4	7	15	17	14
5. FURNITURE AND FIXTURE	3	6	3	4	5	3	9
6. PAPER AND ALLIED PRODUCT	5	6	5	8	6	7	13
7. PRINTING, PUBLISHING AND ALLIED	2	2	1	3	6	3	5
8. PRIMARY METAL	10	16	10	10	12	10	16
9. FABRICATED METAL PRODUCT	11	16	6	7	14	15	15
10. MACHINERY	8	15	6	10	20	13	23
11. TRANSPORTATION EQUIPMENT	6	13	7	8	19	8	11
12. ELECTRICAL AND ELECTRONIC PRODUCTS	13	12	4	3	9	6	13
13. NON-METALLIC MINERAL PRODUCTS	3	13	11	11	18	13	13
14. PETROLEUM AND CHEMICALS	5	4	5	7	7	5	6
15. OTHER MANUFACTURING	8	3	5	7	9	2	2
TOTAL	7	9	6	7	11	10	11

TABLE 16
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH										
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	30	9	4	19	14	9	0	3	9	4	
2. RUBBER AND PLASTIC	42	16	4	21	25	4	10	10	17	8	
3. LEATHER, TEXTILE AND CLOTHING	30	16	7	16	20	4	6	9	6	6	
4. WOOD	25	18	10	24	14	16	5	2	15	8	
5. FURNITURE AND FIXTURE	26	17	10	15	29	3	4	8	3	4	
6. PAPER AND ALLIED PRODUCT	51	13	9	21	27	6	7	2	14	7	
7. PRINTING, PUBLISHING AND ALLIED	31	18	10	14	14	8	2	1	16	3	
8. PRIMARY METAL	68	27	10	16	47	2	11	5	5	18	
9. FABRICATED METAL PRODUCT	42	21	9	12	44	4	13	4	2	4	
10. MACHINERY	69	33	13	15	71	5	5	19	2	1	
11. TRANSPORTATION EQUIPMENT	64	40	30	33	48	21	39	55	22	22	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	73	28	22	27	55	17	27	25	21	15	
13. NON-METALLIC MINERAL PRODUCTS	24	14	8	25	13	4	12	4	19	6	
14. PETROLEUM AND CHEMICALS	62	10	9	14	12	3	8	6	28	3	
15. OTHER MANUFACTURING	40	10	7	12	18	12	18	20	2	3	
TOTAL	49	20	13	21	30	9	15	16	15	9	

(CONTINUED)

TABLE 16
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	23	27	30	30	22	57	42	39	17	9	
2. RUBBER AND PLASTIC	19	30	37	31	34	74	48	44	35	10	
3. LEATHER, TEXTILE AND CLOTHING	18	10	26	27	16	27	29	38	23	10	
4. WOOD	31	24	25	24	21	63	43	30	25	7	
5. FURNITURE AND FIXTURE	3	9	14	15	12	21	19	46	23	7	
6. PAPER AND ALLIED PRODUCT	44	53	43	38	39	84	70	48	31	25	
7. PRINTING, PUBLISHING AND ALLIED	17	10	22	18	25	39	26	33	25	8	
8. PRIMARY METAL	50	62	57	68	32	85	74	38	28	58	
9. FABRICATED METAL PRODUCT	5	9	14	17	17	51	29	34	26	13	
10. MACHINERY	13	20	27	13	17	45	31	48	30	13	
11. TRANSPORTATION EQUIPMENT	46	47	68	57	75	71	57	65	55	25	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	35	51	55	47	30	61	54	65	49	33	
13. NON-METALLIC MINERAL PRODUCTS	21	22	20	28	21	72	53	45	24	14	
14. PETROLEUM AND CHEMICALS	38	44	45	34	37	78	64	60	36	30	
15. OTHER MANUFACTURING	8	19	27	22	29	38	20	46	28	17	
TOTAL	31	35	41	37	35	64	50	49	33	21	

(CONTINUED)

TABLE 16
THE USE OF TECHNOLOGY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

IND	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF SHIP.	PERCENT OF SHIP.
1. FOOD, BEVERAGE AND TOBACCO	21	4
2. RUBBER AND PLASTIC	19	3
3. LEATHER, TEXTILE AND CLOTHING	14	7
4. WOOD	19	2
5. FURNITURE AND FIXTURE	10	1
6. PAPER AND ALLIED PRODUCT	41	7
7. PRINTING, PUBLISHING AND ALLIED	14	2
8. PRIMARY METAL	65	3
9. FABRICATED METAL PRODUCT	10	2
10. MACHINERY	10	2
11. TRANSPORTATION EQUIPMENT	50	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	19	14
13. NON-METALLIC MINERAL PRODUCTS	39	11
14. PETROLEUM AND CHEMICALS	58	12
15. OTHER MANUFACTURING	10	12
TOTAL	34	7

TABLE 17
THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP, BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	33	35	11	30	88	42	25
2. RUBBER AND PLASTIC	45	50	25	35	78	53	29
3. LEATHER, TEXTILE AND CLOTHING	35	33	11	22	52	39	18
4. WOOD	34	36	18	34	68	34	22
5. FURNITURE AND FIXTURE	30	38	7	10	34	47	14
6. PAPER AND ALLIED PRODUCT	54	35	19	58	88	50	48
7. PRINTING, PUBLISHING AND ALLIED	41	25	17	21	56	33	16
8. PRIMARY METAL	74	63	23	66	92	40	72
9. FABRICATED METAL PRODUCT	45	51	5	10	63	42	21
10. MACHINERY	74	79	3	21	59	52	18
11. TRANSPORTATION EQUIPMENT	64	73	24	54	95	67	54
12. ELECTRICAL AND ELECTRONIC PRODUCTS	74	67	22	55	86	69	43
13. NON-METALLIC MINERAL PRODUCTS	34	38	22	31	79	87	45
14. PETROLEUM AND CHEMICALS	63	27	29	51	87	82	60
15. OTHER MANUFACTURING	42	33	5	20	47	87	20
TOTAL	52	47	18	41	77	51	40

TABLE 18
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE PERCENT OF SHIP.	1B CAD/CAM PERCENT OF SHIP.	1C CAD PROC PERCENT OF SHIP.	2A FMC/S PERCENT OF SHIP.	2B NC/CNC PERCENT OF SHIP.	2C LASER PERCENT OF SHIP.	2D ROBOT PP PERCENT OF SHIP.	2E ROBOT OTH PERCENT OF SHIP.	3A AS/RS PERCENT OF SHIP.	3B AGVS PERCENT OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	9	6	9	4	1	2	3	.	4	4
2. RUBBER AND PLASTIC	6	2	10	5	1	0	13	4	5	3
3. LEATHER, TEXTILE AND CLOTHING	7	2	4	2	1	1	4	4	5	3
4. WOOD	5	2	3	2	1	1	2	1	2	1
5. FURNITURE AND FIXTURE	23	11	11	8	4	2	4	2	2	1
6. PAPER AND ALLIED PRODUCT	17	2	5	1	4	4	5	4	8	4
7. PRINTING, PUBLISHING AND ALLIED	3	4	2	1	0	3	1	1	2	1
8. PRIMARY METAL	5	2	2	.	3	2	1	7	25	20
9. FABRICATED METAL PRODUCT	19	15	16	12	3	2	3	9	3	0
10. MACHINERY	11	15	13	7	3	6	4	6	6	0
11. TRANSPORTATION EQUIPMENT	4	6	6	7	1	22	4	6	24	24
12. ELECTRICAL AND ELECTRONIC PRODUCTS	4	11	9	6	0	4	8	4	1	1
13. NON-METALLIC MINERAL PRODUCTS	10	6	3	2	7	2	2	3	3	3
14. PETROLEUM AND CHEMICALS	11	1	10	3	3	2	1	1	1	3
15. OTHER MANUFACTURING	5	3	7	2	0	1	3	4	.	.
TOTAL	9	5	7	4	2	6	3	4	9	8

(CONTINUED)

TABLE 18
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	12	10	8	12	8	4	10	17	24	11	
2. RUBBER AND PLASTIC	3	7	9	14	8	2	13	18	22	5	
3. LEATHER, TEXTILE AND CLOTHING	7	5	5	7	7	4	10	14	14	4	
4. WOOD	2	2	8	5	6	2	7	14	7	5	
5. FURNITURE AND FIXTURE	10	5	10	15	13	8	12	13	21	6	
6. PAPER AND ALLIED PRODUCT	4	10	22	22	15	3	8	17	18	12	
7. PRINTING, PUBLISHING AND ALLIED	2	2	13	14	6	2	9	14	11	3	
8. PRIMARY METAL	1	3	14	3	40	0	5	3	14	3	
9. FABRICATED METAL PRODUCT	12	19	26	13	18	5	19	19	13	8	
10. MACHINERY	6	2	18	11	14	5	12	10	19	6	
11. TRANSPORTATION EQUIPMENT	16	11	5	12	5	1	3	6	10	11	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	5	1	11	14	11	2	13	10	18	11	
13. NON-METALLIC MINERAL PRODUCTS	2	2	24	28	14	2	14	10	18	12	
14. PETROLEUM AND CHEMICALS	4	2	18	16	12	3	6	7	13	7	
15. OTHER MANUFACTURING	3	1	7	6	2	3	6	6	14	1	
TOTAL	8	7	12	13	12	3	9	11	15	8	

(CONTINUED)

TABLE 18

THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH			
	7B SCADA		7C AI/ES	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
IND				
1. FOOD, BEVERAGE AND TOBACCO	13		4	
2. RUBBER AND PLASTIC	11		7	
3. LEATHER, TEXTILE AND CLOTHING	9		3	
4. WOOD	6		2	
5. FURNITURE AND FIXTURE	10		1	
6. PAPER AND ALLIED PRODUCT	8		3	
7. PRINTING, PUBLISHING AND ALLIED	3		2	
8. PRIMARY METAL	3		31	
9. FABRICATED METAL PRODUCT	13		13	
10. MACHINERY	9		2	
11. TRANSPORTATION EQUIPMENT	10		34	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	15		5	
13. NON-METALLIC MINERAL PRODUCTS	16		3	
14. PETROLEUM AND CHEMICALS	7		20	
15. OTHER MANUFACTURING	6		0	
TOTAL	9		14	

TABLE 19
THE PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2 YEARS.
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
LMD							
1. FOOD, BEVERAGE AND TOBACCO	13	10	8	13	27	27	20
2. RUBBER AND PLASTIC	16	16	5	8	26	27	17
3. LEATHER, TEXTILE AND CLOTHING	10	9	6	10	23	18	11
4. WOOD	7	6	2	4	18	16	10
5. FURNITURE AND FIXTURE	29	18	2	12	24	25	12
6. PAPER AND ALLIED PRODUCT	19	13	8	11	37	24	18
7. PRINTING, PUBLISHING AND ALLIED	6	7	3	3	22	15	6
8. PRIMARY METAL	6	12	25	5	46	15	35
9. FABRICATED METAL PRODUCT	27	27	3	19	46	26	25
10. MACHINERY	30	22	6	7	40	24	12
11. TRANSPORTATION EQUIPMENT	12	31	24	17	21	11	45
12. ELECTRICAL AND ELECTRONIC PRODUCTS	19	16	2	5	33	19	21
13. NON-METALLIC MINERAL PRODUCTS	17	14	4	2	46	21	22
14. PETROLEUM AND CHEMICALS	20	9	4	5	32	16	29
15. OTHER MANUFACTURING	13	9	.	3	13	17	7
TOTAL	15	16	10	10	30	19	25

TABLE 20
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH									
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
IND										
1. FOOD, BEVERAGE AND TOBACCO	4	3	5	4	4	1	9	12	15	7
2. RUBBER AND PLASTIC	13	13	20	5	3	1	10	7	12	15
3. LEATHER, TEXTILE AND CLOTHING	8	10	10	4	4	2	5	3	3	3
4. WOOD	5	3	4	1	1	2	2	4	5	2
5. FURNITURE AND FIXTURE	5	12	9	17	13	8	9	13	8	5
6. PAPER AND ALLIED PRODUCT	7	5	6	2	1	3	6	6	8	5
7. PRINTING, PUBLISHING AND ALLIED	1	2	1	6	1	1	3	3	6	7
8. PRIMARY METAL	4	7	3	4	4	6	7	2	3	4
9. FABRICATED METAL PRODUCT	9	10	8	7	6	4	13	6	15	7
10. MACHINERY	4	13	13	10	2	9	12	10	6	7
11. TRANSPORTATION EQUIPMENT	9	6	15	14	0	6	21	4	15	13
12. ELECTRICAL AND ELECTRONIC PRODUCTS	3	20	16	9	2	3	9	6	11	7
13. NON-METALLIC MINERAL PRODUCTS	6	3	3	6	2	1	3	2	9	12
14. PETROLEUM AND CHEMICALS	5	2	8	2	1	1	3	4	11	12
15. OTHER MANUFACTURING	6	15	13	11	11	1	4	8	12	11
TOTAL	6	7	9	6	3	3	9	6	11	8

(CONTINUED)

TABLE 20
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH																			
	4A TEST P		4B TEST F		5A LAN T		5B LAN F		5C WAN		5D PROG C		5E COMP C		6A MRP		6B MRP 11		7A CIM	
	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.
IND																				
1. FOOD, BEVERAGE AND TOBACCO	9		10		9		14		12		4		9		9		13		17	
2. RUBBER AND PLASTIC	10		7		16		14		16		2		13		9		12		28	
3. LEATHER, TEXTILE AND CLOTHING	3		5		7		11		9		5		8		7		11		11	
4. WOOD	9		9		3		7		11		3		6		9		14		8	
5. FURNITURE AND FIXTURE	8		7		5		4		9		11		10		8		15		13	
6. PAPER AND ALLIED PRODUCT	11		8		7		15		13		1		3		11		15		13	
7. PRINTING, PUBLISHING AND ALLIED	2		3		5		5		7		4		5		9		10		5	
8. PRIMARY METAL	0		1		6		4		7		.		0		3		3		8	
9. FABRICATED METAL PRODUCT	11		7		16		21		9		5		8		19		23		11	
10. MACHINERY	6		2		9		16		11		2		10		10		14		9	
11. TRANSPORTATION EQUIPMENT	6		2		20		3		11		1		11		3		5		26	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	19		5		12		15		28		8		11		4		11		14	
13. NON-METALLIC MINERAL PRODUCTS	6		13		6		6		4		3		6		11		12		11	
14. PETROLEUM AND CHEMICALS	4		5		4		9		16		0		6		12		9		10	
15. OTHER MANUFACTURING	15		6		6		12		4		2		7		6		7		5	
TOTAL	7		6		10		10		12		3		8		8		11		14	

(CONTINUED)

TABLE 20
THE PLAN TO USE TECHNOLOGY WITHIN THE NEXT 2-5 YEARS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH		
	7B SCADA	7C AI/ES	
	PERCENT OF SHIP.	PERCENT OF SHIP.	
IND			
1. FOOD, BEVERAGE AND TOBACCO	12	11	
2. RUBBER AND PLASTIC	25	13	
3. LEATHER, TEXTILE AND CLOTHING	8	6	
4. WOOD	8	1	
5. FURNITURE AND FIXTURE	12	2	
6. PAPER AND ALLIED PRODUCT	13	19	
7. PRINTING, PUBLISHING AND ALLIED	6	2	
8. PRIMARY METAL	10	12	
9. FABRICATED METAL PRODUCT	12	7	
10. MACHINERY	11	3	
11. TRANSPORTATION EQUIPMENT	7	10	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	15	14	
13. NON-METALLIC MINERAL PRODUCTS	11	14	
14. PETROLEUM AND CHEMICALS	8	16	
15. OTHER MANUFACTURING	6	3	
TOTAL	10	11	

TABLE 21
THE PLAN TO USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN THE NEXT 2-5 YEARS.
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	8	19	20	11	28	15	26
2. RUBBER AND PLASTIC	28	18	22	14	31	14	46
3. LEATHER, TEXTILE AND CLOTHING	16	13	4	5	20	12	17
4. WOOD	8	6	6	12	21	15	11
5. FURNITURE AND FIXTURE	16	31	11	10	19	16	15
6. PAPER AND ALLIED PRODUCT	12	11	9	13	26	17	27
7. PRINTING, PUBLISHING AND ALLIED	3	9	10	3	14	12	9
8. PRIMARY METAL	13	17	7	1	12	5	26
9. FABRICATED METAL PRODUCT	18	29	16	11	33	26	22
10. MACHINERY	24	28	10	8	30	17	18
11. TRANSPORTATION EQUIPMENT	19	32	19	6	24	5	32
12. ELECTRICAL AND ELECTRONIC PRODUCTS	26	19	14	19	37	11	31
13. NON-METALLIC MINERAL PRODUCTS	9	10	13	14	17	18	23
14. PETROLEUM AND CHEMICALS	12	6	15	6	28	14	28
15. OTHER MANUFACTURING	21	23	13	17	17	9	10
TOTAL	15	18	14	9	25	13	25

TABLE 22
THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH													
	1A CAD/CAE		1B CAD/CAM		1C CAD PROC		2A FMC/S		2B NC/CNC		2C LASER		2D ROBOT PP	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
1MO														
1. FOOD, BEVERAGE AND TOBACCO	13	9	13		8	4	4	4	12	12	20	11		
2. RUBBER AND PLASTIC	19	15	29	9	4	1	22	11	18					
3. LEATHER, TEXTILE AND CLOTHING	15	12	15	7	5	3	9	8	6					
4. WOOD	10	5	7	4	3	3	5	7	3					
5. FURNITURE AND FIXTURE	28	24	20	25	17	10	13	15	6					
6. PAPER AND ALLIED PRODUCT	24	7	12	3	5	7	11	9	9					
7. PRINTING, PUBLISHING AND ALLIED	4	6	3	7	1	4	4	4	8					
8. PRIMARY METAL	9	9	5	4	6	8	8	9	24					
9. FABRICATED METAL PRODUCT	28	24	24	18	9	6	16	18	7					
10. MACHINERY	15	28	26	17	5	15	16	17	7					
11. TRANSPORTATION EQUIPMENT	13	12	21	21	2	28	25	11	37					
12. ELECTRICAL AND ELECTRONIC PRODUCTS	7	31	25	15	2	7	15	10	8					
13. NON METALLIC MINERAL PRODUCTS	16	9	6	8	9	3	5	15	15					
14. PETROLEUM AND CHEMICALS	17	3	17	6	3	2	5	4	15					
15. OTHER MANUFACTURING	12	18	21	14	12	2	7	11	11					
TOTAL	15	12	16	11	4	9	13	10	16					

(CONTINUED)

TABLE 22
THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	22	20	17	26	20	7	20	26	37	28	
2. RUBBER AND PLASTIC	14	14	25	28	23	4	25	25	35	31	
3. LEATHER, TEXTILE AND CLOTHING	10	10	12	18	17	10	18	21	25	15	
4. WOOD	11	11	11	12	16	5	13	23	21	12	
5. FURNITURE AND FIXTURE	17	11	16	19	22	19	22	21	36	19	
6. PAPER AND ALLIED PRODUCT	15	18	29	36	28	4	11	29	33	24	
7. PRINTING, PUBLISHING AND ALLIED	4	5	19	19	13	6	15	22	21	7	
8. PRIMARY METAL	2	4	21	7	47	0	6	6	18	9	
9. FABRICATED METAL PRODUCT	22	25	42	34	27	10	27	38	37	20	
10. MACHINERY	12	4	26	27	25	6	22	20	34	15	
11. TRANSPORTATION EQUIPMENT	22	13	25	15	16	2	14	9	15	37	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	23	6	23	29	40	9	23	14	29	25	
13. NON-METALLIC MINERAL PRODUCTS	8	15	30	34	18	5	19	20	30	22	
14. PETROLEUM AND CHEMICALS	8	7	22	25	28	3	12	19	23	17	
15. OTHER MANUFACTURING	18	8	13	17	6	5	13	12	21	6	
TOTAL	15	13	22	23	24	5	16	20	26	23	

(CONTINUED)

TABLE 22

THE PLANNED USE OF TECHNOLOGY (2 YEARS OR 2-5 YEARS)
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

IND	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF SHIP.	PERCENT OF SHIP.
1. FOOD, BEVERAGE AND TOBACCO	25	15
2. RUBBER AND PLASTIC	36	20
3. LEATHER, TEXTILE AND CLOTHING	18	9
4. WOOD	13	3
5. FURNITURE AND FIXTURE	22	3
6. PAPER AND ALLIED PRODUCT	21	22
7. PRINTING, PUBLISHING AND ALLIED	8	4
8. PRIMARY METAL	13	43
9. FABRICATED METAL PRODUCT	25	21
10. MACHINERY	20	5
11. TRANSPORTATION EQUIPMENT	17	44
12. ELECTRICAL AND ELECTRONIC PRODUCTS	30	20
13. NON-METALLIC MINERAL PRODUCTS	27	17
14. PETROLEUM AND CHEMICALS	15	36
15. OTHER MANUFACTURING	12	3
TOTAL	20	24

TABLE 23
THE PLAN TO USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP WITHIN 2 YEARS OR 2-5 YEARS, BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	8	7	12	15	27	26	23
2. RUBBER AND PLASTIC	24	16	7	10	28	30	21
3. LEATHER, TEXTILE AND CLOTHING	13	9	3	9	19	18	14
4. WOOD	15	8	7	10	18	26	8
5. FURNITURE AND FIXTURE	14	20	6	8	12	30	14
6. PAPER AND ALLIED PRODUCT	20	19	21	18	39	43	26
7. PRINTING, PUBLISHING AND ALLIED	8	3	1	1	22	19	7
8. PRIMARY METAL	19	20	11	5	29	32	21
9. FABRICATED METAL PRODUCT	28	23	3	7	35	19	17
10. MACHINERY	39	20	3	4	32	35	17
11. TRANSPORTATION EQUIPMENT	37	39	12	29	46	39	31
12. ELECTRICAL AND ELECTRONIC PRODUCTS	42	20	11	16	53	44	26
13. NON-METALLIC MINERAL PRODUCTS	17	10	7	12	18	14	12
14. PETROLEUM AND CHEMICALS	10	12	8	13	32	25	20
15. OTHER MANUFACTURING	12	9	1	3	19	16	3
TOTAL	18	13	5	9	26	24	15

TABLE 24

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH											
	1A CAD/CAE		1B CAD/CAM		1C CAD PROC		2A FMC/S		2B NC/CNC		2C LASER	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
IND												
1. FOOD, BEVERAGE AND TOBACCO	46	117	67	59	68	73	59	61	40	54		
2. RUBBER AND PLASTIC	28	55	50	49	54	76	43	45	36	43		
3. LEATHER, TEXTILE AND CLOTHING	41	53	59	56	57	71	63	63	55	59		
4. WOOD	47	60	63	59	68	65	73	75	56	69		
5. FURNITURE AND FIXTURE	35	45	54	45	42	68	60	57	65	68		
6. PAPER AND ALLIED PRODUCT	22	72	86	68	60	76	89	72	49	61		
7. PRINTING, PUBLISHING AND ALLIED	62	63	72	71	71	79	84	83	62	86		
8. PRIMARY METAL	18	53	65	72	39	74	60	63	38	32		
9. FABRICATED METAL PRODUCT	19	38	48	47	37	56	53	53	50	57		
10. MACHINERY	12	26	40	46	19	55	51	45	52	82		
11. TRANSPORTATION EQUIPMENT	20	43	45	44	47	43	28	29	11	18		
12. ELECTRICAL AND ELECTRONIC PRODUCTS	14	28	35	38	36	52	24	28	31	40		
13. NON-METALLIC MINERAL PRODUCTS	56	66	77	61	73	86	60	65	47	58		
14. PETROLEUM AND CHEMICALS	18	83	65	73	76	86	79	80	41	60		
15. OTHER MANUFACTURING	39	59	59	59	60	87	57	54	60	72		
TOTAL	29	57	58	57	56	67	56	57	39	49		

(CONTINUED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROS C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	
IND											
1. FOOD, BEVERAGE AND TOBACCO	39	37	42	32	40	26	25	21	30	45	
2. RUBBER AND PLASTIC	46	38	27	27	27	15	17	22	16	37	
3. LEATHER, TEXTILE AND CLOTHING	52	58	48	41	46	49	39	29	36	51	
4. WOOD	46	49	50	51	45	28	30	32	42	64	
5. FURNITURE AND FIXTURE	64	65	56	50	51	44	43	27	33	56	
6. PAPER AND ALLIED PRODUCT	32	23	22	22	23	10	16	11	18	33	
7. PRINTING, PUBLISHING AND ALLIED	70	68	53	53	45	47	54	36	42	67	
8. PRIMARY METAL	25	21	19	17	13	11	14	36	31	18	
9. FABRICATED METAL PRODUCT	47	44	29	33	32	30	29	15	19	44	
10. MACHINERY	48	49	30	39	39	35	32	19	21	39	
11. TRANSPORTATION EQUIPMENT	28	35	4	12	3	23	24	20	23	32	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	22	24	13	15	17	20	17	5	7	24	
13. NON-METALLIC MINERAL PRODUCTS	57	59	39	33	47	20	21	26	37	54	
14. PETROLEUM AND CHEMICALS	43	43	27	35	27	17	21	17	28	43	
15. OTHER MANUFACTURING	55	57	50	51	49	46	54	36	40	59	
TOTAL	40	40	29	29	28	25	25	21	27	41	

(CONTINUED)

TABLE 24

NO PLAN TO USE TECHNOLOGY BECAUSE IT DOES NOT APPLY
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

IND	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF SHIP.	PERCENT OF SHIP.
1. FOOD, BEVERAGE AND TOBACCO	38	54
2. RUBBER AND PLASTIC	27	42
3. LEATHER, TEXTILE AND CLOTHING	49	58
4. WOOD	52	74
5. FURNITURE AND FIXTURE	49	71
6. PAPER AND ALLIED PRODUCT	25	44
7. PRINTING, PUBLISHING AND ALLIED	62	70
8. PRIMARY METAL	14	33
9. FABRICATED METAL PRODUCT	44	45
10. MACHINERY	40	51
11. TRANSPORTATION EQUIPMENT	28	36
12. ELECTRICAL AND ELECTRONIC PRODUCTS	30	34
13. NON-METALLIC MINERAL PRODUCTS	29	61
14. PETROLEUM AND CHEMICALS	22	42
15. OTHER MANUFACTURING	58	65
TOTAL	34	47

TABLE 25
NO PLAN TO USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT DOES NOT APPLY,
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING PERCENT OF SHIP.	2. FABRICATION AND ASSEMBLY PERCENT OF SHIP.	3. AUTOMATED MATERIAL HANDLING PERCENT OF SHIP.	4. AUTOMATED SENSOR BASED PERCENT OF SHIP.	5. COMMUNICATIONS AND CONTROL PERCENT OF SHIP.	6. MANUFACTURING INFORMATION PERCENT OF SHIP.	7. INTEGRATION AND CONTROL PERCENT OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	74	86	54	41	55	31	61
2. RUBBER AND PLASTIC	60	88	48	48	40	26	49
3. LEATHER, TEXTILE AND CLOTHING	62	79	62	60	62	37	62
4. WOOD	70	85	74	53	66	42	77
5. FURNITURE AND FIXTURE	56	79	74	71	68	34	73
6. PAPER AND ALLIED PRODUCT	76	89	66	35	38	21	51
7. PRINTING, PUBLISHING AND ALLIED	79	89	69	73	68	42	77
8. PRIMARY METAL	69	92	42	26	25	36	35
9. FABRICATED METAL PRODUCT	54	84	60	48	49	21	60
10. MACHINERY	44	77	64	54	54	26	58
11. TRANSPORTATION EQUIPMENT	54	67	19	36	30	27	42
12. ELECTRICAL AND ELECTRONIC PRODUCTS	37	64	43	26	38	8	40
13. NON-METALLIC MINERAL PRODUCTS	81	92	61	62	54	39	65
14. PETROLEUM AND CHEMICALS	91	92	62	49	47	29	51
15. OTHER MANUFACTURING	64	73	73	57	68	41	72
TOTAL	67	82	52	44	46	29	54

TABLE 26
NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH													
	1A CAD/CAE		1B CAD/CAM		1C CAD PROC		2A FMC/S		2B MC/CNC		2C LASER		2D ROBOT PP	
	PERCENT OF SHIP.		PERCENT OF SHIP.		PERCENT OF SHIP.		PERCENT OF SHIP.		PERCENT OF SHIP.		PERCENT OF SHIP.		PERCENT OF SHIP.	
IND														
1. FOOD, BEVERAGE AND TOBACCO	5		6		7		6		6		6		11	
2. RUBBER AND PLASTIC	6		8		10		12		8		8		12	
3. LEATHER, TEXTILE AND CLOTHING	7		7		8		9		9		11		13	
4. WOOD	10		8		10		5		7		9		9	
5. FURNITURE AND FIXTURE	8		8		8		7		10		10		15	
6. PAPER AND ALLIED PRODUCT	2		6		8		4		4		7		8	
7. PRINTING, PUBLISHING AND ALLIED	1		2		4		3		5		5		6	
8. PRIMARY METAL	1		0		2		0		0		0		0	
9. FABRICATED METAL PRODUCT	5		9		9		15		5		14		9	
10. MACHINERY	1		9		7		14		4		17		18	
11. TRANSPORTATION EQUIPMENT	2		4		2		1		2		4		4	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	1		4		4		12		3		7		23	
13. NON-METALLIC MINERAL PRODUCTS	2		5		3		2		1		3		14	
14. PETROLEUM AND CHEMICALS	3		3		7		4		4		5		5	
15. OTHER MANUFACTURING	6		7		7		10		5		13		12	
TOTAL	4		5		6		6		4		7		9	

(CONTINUED)

TABLE 26
NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH																			
	4A TEST P		4B TEST F		5A LAN T		5B LAN F		5C WAN		5D PROG C		5E COMP C		6A MRP		6B MRP 11		7A CIM	
	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.	PERCENT	OF SHIP.
IND																				
1. FOOD, BEVERAGE AND TOBACCO	9		9		5		5		8		3		5		4		6		11	
2. RUBBER AND PLASTIC	13		9		5		7		7		1		4		4		5		11	
3. LEATHER, TEXTILE AND CLOTHING	10		11		5		6		8		6		7		5		7		11	
4. WOOD	6		6		4		3		6		3		5		5		3		5	
5. FURNITURE AND FIXTURE	6		6		6		7		6		6		7		3		4		9	
6. PAPER AND ALLIED PRODUCT	3		2		1		1		3		1		1		5		6		12	
7. PRINTING, PUBLISHING AND ALLIED	4		3		2		6		7		3		2		2		4		4	
8. PRIMARY METAL	6		6		2		3		1		0		0		0		1		4	
9. FABRICATED METAL PRODUCT	13		12		6		9		8		5		10		4		5		14	
10. MACHINERY	19		20		9		10		9		5		7		4		5		14	
11. TRANSPORTATION EQUIPMENT	3		2		1		1		3		2		2		1		1		2	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	12		9		3		4		6		4		1		4		2		8	
13. NON-METALLIC MINERAL PRODUCTS	12		3		1		1		5		1		4		4		4		5	
14. PETROLEUM AND CHEMICALS	9		4		3		2		4		1		2		2		7		7	
15. OTHER MANUFACTURING	14		10		5		5		9		4		4		2		7		13	
TOTAL	8		6		3		4		5		3		4		3		4		8	

(CONTINUED)

TABLE 26

NO PLAN TO USE TECHNOLOGY BECAUSE IT IS NOT COST EFFECTIVE
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA PERCENT OF SHIP.	7C AI/ES PERCENT OF SHIP.
IND		
1. FOOD, BEVERAGE AND TOBACCO	10	16
2. RUBBER AND PLASTIC	10	18
3. LEATHER, TEXTILE AND CLOTHING	9	12
4. WOOD	5	8
5. FURNITURE AND FIXTURE	9	11
6. PAPER AND ALLIED PRODUCT	7	13
7. PRINTING, PUBLISHING AND ALLIED	5	9
8. PRIMARY METAL	1	2
9. FABRICATED METAL PRODUCT	11	15
10. MACHINERY	12	19
11. TRANSPORTATION EQUIPMENT	0	7
12. ELECTRICAL AND ELECTRONIC PRODUCTS	13	11
13. NON-METALLIC MINERAL PRODUCTS	3	4
14. PETROLEUM AND CHEMICALS	3	5
15. OTHER MANUFACTURING	13	14
TOTAL	6	10

TABLE 27
NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP BECAUSE IT IS NOT COST EFFECTIVE.
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	9	16	25	10	14	6	18
2. RUBBER AND PLASTIC	13	24	29	15	12	5	24
3. LEATHER, TEXTILE AND CLOTHING	10	20	20	12	12	7	13
4. WOOD	13	13	13	6	9	6	10
5. FURNITURE AND FIXTURE	10	23	20	7	9	4	14
6. PAPER AND ALLIED PRODUCT	12	15	19	3	4	6	16
7. PRINTING, PUBLISHING AND ALLIED	4	9	13	4	11	5	10
8. PRIMARY METAL	3	1	5	6	4	1	5
9. FABRICATED METAL PRODUCT	12	25	23	13	15	5	19
10. MACHINERY	11	34	30	21	19	5	23
11. TRANSPORTATION EQUIPMENT	4	9	23	3	4	1	8
12. ELECTRICAL AND ELECTRONIC PRODUCTS	6	32	31	13	13	5	16
13. NON-METALLIC MINERAL PRODUCTS	7	17	22	13	8	4	7
14. PETROLEUM AND CHEMICALS	10	9	24	11	7	7	9
15. OTHER MANUFACTURING	10	20	19	14	12	7	19
TOTAL	8	15	22	9	9	5	13

TABLE 28
NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH											
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B NC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS		
	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP	PERCENT OF SHIP
LND												
1. FOOD, BEVERAGE AND TOBACCO	6	8	9	7	8	9	9	12	10	12		
2. RUBBER AND PLASTIC	4	6	6	9	9	11	12	13	8	7		
3. LEATHER, TEXTILE AND CLOTHING	7	12	12	11	10	11	9	11	13	12		
4. WOOD	8	9	10	8	8	8	8	9	8	11		
5. FURNITURE AND FIXTURE	4	5	7	7	4	8	8	9	5	7		
6. PAPER AND ALLIED PRODUCT	1	2	5	4	3	4	5	5	8	8		
7. PRINTING, PUBLISHING AND ALLIED	2	11	12	5	0	4	4	4	4	11		
8. PRIMARY METAL	4	11	17	8	6	16	21	22	24	21		
9. FABRICATED METAL PRODUCT	5	7	9	8	6	20	10	12	10	18		
10. MACHINERY	3	4	14	9	2	8	10	6	8	7		
11. TRANSPORTATION EQUIPMENT	0	1	1	1	2	3	3	3	10	5		
12. ELECTRICAL AND ELECTRONIC PRODUCTS	6	10	15	8	4	16	10	13	12	13		
13. NON-METALLIC MINERAL PRODUCTS	2	6	5	4	4	4	9	12	5	4		
14. PETROLEUM AND CHEMICALS	0	0	1	3	3	3	3	4	1	5		
15. OTHER MANUFACTURING	2	6	7	5	4	5	5	4	7	5		
TOTAL	3	6	7	6	5	8	8	9	9	10		

(CONTINUED)

TABLE 28
NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH										
	4A TEST P		4B TEST F		5A LAN T		5B LAN F		5C WAN		7A CIM
	PERCENT	OF SHIP	PERCENT	OF SHIP	PERCENT	OF SHIP	PERCENT	OF SHIP	PERCENT	OF SHIP	PERCENT
IND											
1. FOOD, BEVERAGE AND TOBACCO	7		7		6		6		10		7
2. RUBBER AND PLASTIC	9		9		5		7		7		11
3. LEATHER, TEXTILE AND CLOTHING	10		10		8		7		12		12
4. WOOD	6		9		10		10		10		12
5. FURNITURE AND FIXTURE	9		9		9		8		8		9
6. PAPER AND ALLIED PRODUCT	7		4		4		3		7		6
7. PRINTING, PUBLISHING AND ALLIED	5		13		4		4		9		14
8. PRIMARY METAL	18		7		2		5		7		10
9. FABRICATED METAL PRODUCT	10		9		9		7		15		9
10. MACHINERY	8		7		7		10		10		19
11. TRANSPORTATION EQUIPMENT	2		3		2		3		3		5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	7		11		6		5		6		10
13. NON-METALLIC MINERAL PRODUCTS	2		2		8		4		9		5
14. PETROLEUM AND CHEMICALS	1		2		3		3		4		2
15. OTHER MANUFACTURING	5		4		5		5		7		5
TOTAL	6		6		5		5		7		7

(CONTINUED)

TABLE 28

NO PLAN TO USE TECHNOLOGY FOR OTHER REASONS
BY INDUSTRY AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH	
	7B SCADA PERCENT OF SHIP	7C AI/ES PERCENT OF SHIP
IND		
1. FOOD, BEVERAGE AND TOBACCO	6	11
2. RUBBER AND PLASTIC	8	17
3. LEATHER, TEXTILE AND CLOTHING	10	14
4. WOOD	11	13
5. FURNITURE AND FIXTURE	10	13
6. PAPER AND ALLIED PRODUCT	7	13
7. PRINTING, PUBLISHING AND ALLIED	11	14
8. PRIMARY METAL	7	19
9. FABRICATED METAL PRODUCT	10	17
10. MACHINERY	18	23
11. TRANSPORTATION EQUIPMENT	4	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	9	21
13. NON-METALLIC MINERAL PRODUCTS	2	7
14. PETROLEUM AND CHEMICALS	1	4
15. OTHER MANUFACTURING	7	6
TOTAL	7	11

TABLE 29

NO PLAN TO USE AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP FOR OTHER REASONS,
BY INDUSTRY
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING PERCENT OF SHIP.	2. FABRICATION AND ASSEMBLY PERCENT OF SHIP.	3. AUTOMATED MATERIAL HANDLING PERCENT OF SHIP.	4. AUTOMATED SENSOR BASED PERCENT OF SHIP.	5. COMMUNICATIONS AND CONTROL PERCENT OF SHIP.	6. MANUFACTURING INFORMATION PERCENT OF SHIP.	7. INTEGRATION AND CONTROL PERCENT OF SHIP.
IND							
1. FOOD, BEVERAGE AND TOBACCO	10	14	13	7	12	12	12
2. RUBBER AND PLASTIC	7	19	8	11	12	9	21
3. LEATHER, TEXTILE AND CLOTHING	13	17	14	12	16	9	15
4. WOOD	10	13	11	9	14	12	16
5. FURNITURE AND FIXTURE	7	13	7	9	13	6	14
6. PAPER AND ALLIED PRODUCT	6	8	10	8	9	11	14
7. PRINTING, PUBLISHING AND ALLIED	12	9	12	13	10	8	16
8. PRIMARY METAL	17	29	29	18	9	25	22
9. FABRICATED METAL PRODUCT	12	25	16	10	20	15	22
10. MACHINERY	15	18	8	8	16	15	31
11. TRANSPORTATION EQUIPMENT	1	6	11	3	6	6	5
12. ELECTRICAL AND ELECTRONIC PRODUCTS	17	22	14	11	13	15	22
13. NON-METALLIC MINERAL PRODUCTS	6	15	7	2	15	7	10
14. PETROLEUM AND CHEMICALS	1	4	6	2	8	3	6
15. OTHER MANUFACTURING	8	7	7	5	8	4	8
TOTAL	8	13	12	7	11	10	13

TABLE 30
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH																			
	1A CAD/CAE		1B CAD/CAM		1C CAD PROC		2A FMC/S		2B NC/CNC		2C LASER		2D ROBOT PP		2E ROBOT OTH		3A AS/RS		3B AGVS	
	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.	PERCENT	OF EST.
PRO																				
NEWFOUNDLAND	15		10		13		4		6		1		2		2		14		1	
PRINCE EDWARD ISLAND	6								4		1									
NOVA SCOTIA	16		4		1		3		5		0				1		1		0	
NEW BRUNSWICK	17		5		12		4		14		1		0		0		1		1	
QUEBEC	17		8		4		10		17		3		4		6		5		5	
ONTARIO	18		6		4		8		15		1		5		2		4		2	
MANITOBA	17		9		6		6		10		3		1		2		4		2	
SASKATCHEWAN	18		6		2		2		7		6		1				1			
ALBERTA	19		3		2		3		10		2		0		0		5			
BRITISH COLUMBIA	13		9		2		4		10		2		2		1		3		1	
TOTAL	17		7		4		7		14		2		3		3		4		2	

(CONTINUED)

TABLE 30
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH										
	4A TEST P	4B TEST F	5A LAN T	5B LAN F	5C WAN	5D PROG C	5E COMP C	6A MRP	6B MRP II	7A CIM	
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT	
	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	OF EST.	
PRO											
NEWFOUNDLAND	4	3	18	2	15	10	8	21	13	4	
PRINCE EDWARD ISLAND	4	2	7	4	1	4	2	20	20	.	
NOVA SCOTIA	5	4	6	5	2	10	6	9	4	2	
NEW BRUNSWICK	3	5	5	4	14	11	10	19	19	1	
QUEBEC	12	10	18	17	14	17	13	20	11	4	
ONTARIO	9	9	11	8	12	22	14	18	12	6	
MANITOBA	4	5	5	5	5	13	8	14	9	2	
SASKATCHEWAN	4	4	9	6	2	6	5	12	4	1	
ALBERTA	6	4	5	4	3	15	8	11	5	1	
BRITISH COLUMBIA	8	10	5	5	6	14	7	15	8	2	
TOTAL	9	8	11	9	10	18	12	17	10	4	

(CONTINUED)

TABLE 30
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(ESTABLISHMENT WEIGHTED)

	TECH	
	7B SCADA	7C AI/ES
	PERCENT OF EST.	PERCENT OF EST.
PRO		
NEWFOUNDLAND	13	2
PRINCE EDWARD ISLAND	.	.
NOVA SCOTIA	4	1
NEW BRUNSWICK	3	1
QUEBEC	8	1
ONTARIO	8	3
MANITOBA	5	1
SASKATCHEWAN	1	0
ALBERTA	3	1
BRITISH COLUMBIA	3	0
TOTAL	6	2

TABLE 31

THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP, BY PROVINCE
(ESTABLISHMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING	2. FABRICATION AND ASSEMBLY	3. AUTOMATED MATERIAL HANDLING	4. AUTOMATED SENSOR BASED	5. COMMUNICATIONS AND CONTROL	6. MANUFACTURING INFORMATION	7. INTEGRATION AND CONTROL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
PRO							
NEWFOUNDLAND	23	8	14	5	34	23	13
PRINCE EDWARD ISLAND	6	4	.	4	11	20	.
NOVA SCOTIA	19	8	1	6	11	9	5
NEW BRUNSWICK	18	17	2	5	23	21	4
QUEBEC	19	26	9	14	36	22	10
ONTARIO	20	23	6	11	32	18	13
MANITOBA	20	15	4	6	21	15	6
SASKATCHEWAN	21	15	1	4	15	14	3
ALBERTA	19	14	5	8	21	11	4
BRITISH COLUMBIA	18	15	3	12	22	16	4
TOTAL	19	21	6	11	30	18	9

TABLE 32
THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

	IND									
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING, PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
PRO										
NEWFOUNDLAND	40		100	20	50	82	97		29	100
PRINCE EDWARD ISLAND	56						50		67	
NOVA SCOTIA	43	72	19	2	42	60	42	50	20	5
NEW BRUNSWICK	38	35	35	52	13	67	8	50	15	45
QUEBEC	67	64	38	44	52	70	41	87	63	74
ONTARIO	54	54	35	50	18	58	52	66	51	67
MANITOBA	46	46	32	36	59	52	18	78	24	44
SASKATCHEWAN	52	50	7	69	50	25	50	100	33	51
ALBERTA	44	45	21	32	36	66	51	67	25	43
BRITISH COLUMBIA	40	41	52	41	27	69	53	40	34	79
TOTAL	53	54	37	42	35	63	47	69	48	65

(CONTINUED)

TABLE 32

THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

	IND					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON-METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
PRO						
NEWFOUNDLAND	100	.	42	63	.	49
PRINCE EDWARD ISLAND	.	.	.	16	9	31
NOVA SCOTIA	50	85	50	11	34	32
NEW BRUNSWICK	27	.	53	.	22	34
QUEBEC	63	84	50	65	70	54
ONTARIO	86	69	35	56	25	50
MANITOBA	70	50	78	40	20	38
SASKATCHEWAN	26	64	42	14	35	44
ALBERTA	35	58	41	64	5	37
BRITISH COLUMBIA	47	47	47	49	30	43
TOTAL	70	69	44	55	35	48

TABLE 33
THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

IND										
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING, PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
PRO										
NEWFOUNDLAND	35		100	20	50	82	97		14	100
PRINCE EDWARD ISLAND	16						17		67	
NOVA SCOTIA	34	72	17	2	42	60	42	50	20	5
NEW BRUNSWICK	32	35	4	52	13	67	3	50	15	45
QUEBEC	86	51	35	43	42	68	41	87	63	74
ONTARIO	46	52	32	49	17	51	26	68	49	81
MANITOBA	39	46	31	21	39	48	17	78	22	44
SASKATCHEWAN	52	50	7	54	50	25	49	100	33	49
ALBERTA	36	45	13	30	32	52	51	67	25	43
BRITISH COLUMBIA	17	38	35	41	25	69	52	28	28	68
TOTAL	45	49	33	41	29	59	35	68	46	60

(CONTINUED)

TABLE 33

THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(ESTABLISHMENT WEIGHTED)

	IND					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON-METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
PRO						
NEWFOUNDLAND	100	.	42	63	.	46
PRINCE EDWARD ISLAND	.	.	.	16	9	13
NOVA SCOTIA	50	85	50	11	30	29
NEW BRUNSWICK	27	.	53	.	22	31
QUEBEC	62	74	49	62	57	51
ONTARIO	83	63	35	48	22	43
MANITOBA	63	50	78	40	20	34
SASKATCHEWAN	5	64	39	14	35	42
ALBERTA	16	58	41	63	4	35
BRITISH COLUMBIA	37	47	43	47	24	38
TOTAL	65	63	43	50	30	43

TABLE 34
THE USE OF TECHNOLOGY
BY PROVINCE AND 22 TECHNOLOGIES
(SHIPMENT WEIGHTED)

	TECH													
	1A CAD/CAE	1B CAD/CAM	1C CAD PROC	2A FMC/S	2B MC/CNC	2C LASER	2D ROBOT PP	2E ROBOT OTH	3A AS/RS	3B AGVS				
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
PRO														
NEWFOUNDLAND	14	5	12	1	12	0	0	7	14	1				
PRINCE EDWARD ISLAND	2				23	21								
NOVA SCOTIA	27	10	1	6	23	1		16	9	1				
NEW BRUNSWICK	26	10	3	10	10	1	6	0	1	9				
QUEBEC	50	19	11	19	33	8	11	11	14	11				
ONTARIO	53	24	15	23	33	11	21	23	16	11				
MANITOBA	42	23	13	8	25	16	4	3	5	3				
SASKATCHEWAN	47	9	7	18	11	2	6		4					
ALBERTA	48	6	14	16	9	5	1	1	16					
BRITISH COLUMBIA	34	19	10	19	21	10	4	0	12	5				
TOTAL	49	20	13	21	30	9	15	16	15	9				

(CONTINUED)

TABLE 35

THE USE OF AT LEAST ONE OF THE TECHNOLOGIES IN A
TECHNOLOGY GROUP, BY PROVINCE
(SHIPMENT WEIGHTED)

	GRP						
	1. DESIGN AND ENGINEERING PERCENT OF SHIP.	2. FABRICATION AND ASSEMBLY PERCENT OF SHIP.	3. AUTOMATED MATERIAL HANDLING PERCENT OF SHIP.	4. AUTOMATED SENSOR BASED PERCENT OF SHIP.	5. COMMUNICATI- ONS AND CONTROL PERCENT OF SHIP.	6. MANUFACTUR- ING INFORMATION PERCENT OF SHIP.	7. INTEGRATION AND CONTROL PERCENT OF SHIP.
PRO							
NEWFOUNDLAND	25	12	14	22	49	31	30
PRINCE EDWARD ISLAND	2	23	-	38	47	32	-
NOVA SCOTIA	27	30	10	47	68	52	45
NEW BRUNSWICK	29	19	9	23	54	43	26
QUEBEC	52	53	21	42	77	55	40
ONTARIO	56	51	20	42	81	53	43
MANITOBA	48	41	7	24	63	46	18
SASKATCHEWAN	48	25	4	19	52	19	14
ALBERTA	48	25	16	40	77	41	37
BRITISH COLUMBIA	42	35	13	36	68	47	30
TOTAL	52	47	18	41	77	51	40

TABLE 36
THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

	IND									
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
PRO	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
NEWFOUNDLAND	38		100	62	39	99	48		66	100
PRINCE EDWARD ISLAND	87						33		96	
NOVA SCOTIA	81	98	93	14	99	99	29	99	56	42
NEW BRUNSWICK	77	62	32	88	74	97	91	100	93	90
QUEBEC	89	83	67	59	64	90	92	100	95	96
ONTARIO	81	90	76	75	69	89	64	97	76	94
MANITOBA	70	92	68	81	74	83	65	96	70	80
SASKATCHEWAN	66	14	41	96	66	90	38	100	41	83
ALBERTA	79	73	88	86	73	86	88	93	69	72
BRITISH COLUMBIA	86	68	74	83	46	97	81	85	52	93
TOTAL	81	87	71	77	67	92	73	97	78	91

(CONTINUED)

TABLE 36

THE USE OF AT LEAST ONE OF THE 22 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

PRO	IND					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON-METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
NEWFOUNDLAND	100	.	41	96	.	57
PRINCE EDWARD ISLAND	.	.	.	15	84	71
NOVA SCOTIA	85	97	74	96	66	85
NEW BRUNSWICK	73	.	83	.	42	64
QUEBEC	99	94	96	99	73	88
ONTARIO	100	98	91	97	77	90
MANITOBA	97	94	95	76	48	78
SASKATCHEWAN	70	90	84	90	53	75
ALBERTA	54	94	79	98	49	86
BRITISH COLUMBIA	84	88	93	81	39	86
TOTAL	99	96	91	93	73	88

TABLE 37
THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

	IND									
	1. FOOD, BEVERAGE AND TOBACCO	2. RUBBER AND PLASTIC	3. LEATHER, TEXTILE AND CLOTHING	4. WOOD	5. FURNITURE AND FIXTURE	6. PAPER AND ALLIED PRODUCT	7. PRINTING, PUBLISHING AND ALLIED	8. PRIMARY METAL	9. FABRICATED METAL PRODUCT	10. MACHINERY
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
PRO										
NEWFOUNDLAND	30		100	62	39	99	48		26	100
PRINCE EDWARD ISLAND	57						3		96	
NOVA SCOTIA	60	98	77	14	99	99	29	99	56	42
NEW BRUNSWICK	64	62	27	88	74	57	55	100	93	90
QUEBEC	85	78	64	55	61	88	92	100	95	96
ONTARIO	76	86	70	75	64	88	59	97	70	92
MANITOBA	68	92	65	75	51	77	83	96	67	80
SASKATCHEWAN	66	14	41	94	66	90	36	100	41	77
ALBERTA	79	73	45	83	49	80	88	93	68	72
BRITISH COLUMBIA	78	63	70	89	34	97	75	84	47	92
TOTAL	76	84	66	76	61	91	70	97	73	90

(CONTINUED)

TABLE 37

THE USE OF AT LEAST ONE OF THE 17 TECHNOLOGIES
BY INDUSTRY AND PROVINCE
(SHIPMENT WEIGHTED)

	IND					
	11. TRANSPORTATION EQUIPMENT	12. ELECTRICAL AND ELECTRONIC PRODUCTS	13. NON-METALLIC MINERAL PRODUCTS	14. PETROLEUM AND CHEMICALS	15. OTHER MANUFACTURING	TOTAL
	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.	PERCENT OF SHIP.
PRO						
NEWFOUNDLAND	100		41	96		52
PRINCE EDWARD ISLAND				15	84	47
NOVA SCOTIA	85	97	74	96	59	79
NEW BRUNSWICK	73		83		42	60
QUEBEC	98	92	95	97	63	86
ONTARIO	99	96	91	95	68	87
MANITOBA	97	94	95	76	48	76
SASKATCHEWAN	56	90	75	90	53	73
ALBERTA	48	94	79	98	47	84
BRITISH COLUMBIA	82	88	89	63	31	81
TOTAL	98	95	90	90	64	85

TABLE 38
FOR GOODS OF OWN MANUFACTURE, WHAT WAS THE PERCENTAGE OF THE
VALUE OF SHIPMENTS EXPORTED FROM THIS PLANT IN THE LAST YEAR
(ESTABLISHMENT WEIGHTED)

	081							ALL PERCENT OF EST.
	NOT ANSWERED		50%		50%		N/A	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.			
IND								
1. FOOD, BEVERAGE AND TOBACCO	0	30	16	53			99	
2. RUBBER AND PLASTIC	0	55	17	28			100	
3. LEATHER, TEXTILE AND CLOTHING	0	38	11	50			99	
4. WOOD	2	36	24	38			100	
5. FURNITURE AND FIXTURE	.	39	6	55			100	
6. PAPER AND ALLIED PRODUCT	.	45	23	32			100	
7. PRINTING, PUBLISHING AND ALLIED	0	25	15	56	4		100	
8. PRIMARY METAL	.	62	28	10			100	
9. FABRICATED METAL PRODUCT	0	43	13	44			100	
10. MACHINERY	0	56	31	12			99	
11. TRANSPORTATION EQUIPMENT	.	40	41	20			101	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	50	36	14			100	
13. NON-METALLIC MINERAL PRODUCTS	.	28	12	60			100	
14. PETROLEUM AND CHEMICALS	3	50	13	33	0		99	
15. OTHER MANUFACTURING	0	35	7	57	.		99	
TOTAL	1	38	17	44	1		101	

TABLE 39

WHERE IS MOST OF THE RESEARCH AND DEVELOPMENT WORK DONE FOR
THIS PLANT
(ESTABLISHMENT WEIGHTED)

	082						ALL PERCENT OF EST.
	NOT ANSWERED	CONTRACTED	WITHIN	ELSEWHERE	NO R&D DONE		
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.		
IND							
1. FOOD, BEVERAGE AND TOBACCO	.	5	37	36	22	100	
2. RUBBER AND PLASTIC	.	4	47	14	34	99	
3. LEATHER, TEXTILE AND CLOTHING	0	8	38	3	51	100	
4. WOOD	2	9	33	6	50	100	
5. FURNITURE AND FIXTURE	.	1	54	8	37	100	
6. PAPER AND ALLIED PRODUCT	.	6	46	29	20	101	
7. PRINTING, PUBLISHING AND ALLIED	1	9	24	6	61	101	
8. PRIMARY METAL	.	2	54	14	30	100	
9. FABRICATED METAL PRODUCT	.	7	47	6	41	101	
10. MACHINERY	0	9	43	27	20	99	
11. TRANSPORTATION EQUIPMENT	.	1	51	33	15	100	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	4	60	20	16	100	
13. NON-METALLIC MINERAL PRODUCTS	.	13	34	19	34	100	
14. PETROLEUM AND CHEMICALS	3	4	39	39	15	100	
15. OTHER MANUFACTURING	0	6	37	10	47	100	
TOTAL	0	7	39	14	39	99	

TABLE 40
WHERE IS MOST OF THE FORMAL TRAINING DONE FOR YOUR STAFF IN
THIS PLANT
(ESTABLISHMENT WEIGHTED)

	083						
	NOT ANSWERED		PURCHASE		WITHIN		ALL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.
IND							
1. FOOD, BEVERAGE AND TOBACCO	.	9	57	20	13	99	
2. RUBBER AND PLASTIC	.	17	47	12	23	99	
3. LEATHER, TEXTILE AND CLOTHING	1	16	45	10	29	101	
4. WOOD	5	15	41	17	23	101	
5. FURNITURE AND FIXTURE	.	16	60	12	12	100	
6. PAPER AND ALLIED PRODUCT	.	15	63	17	5	100	
7. PRINTING, PUBLISHING AND ALLIED	.	17	53	18	12	100	
8. PRIMARY METAL	.	27	45	17	11	100	
9. FABRICATED METAL PRODUCT	.	16	60	15	9	100	
10. MACHINERY	.	21	51	15	13	100	
11. TRANSPORTATION EQUIPMENT	.	12	59	20	9	100	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	22	60	9	9	100	
13. NON-METALLIC MINERAL PRODUCTS	.	11	87	17	5	100	
14. PETROLEUM AND CHEMICALS	3	19	56	11	10	101	
15. OTHER MANUFACTURING	0	5	49	13	32	99	
TOTAL	1	15	53	15	16	100	

TABLE 41

HOW DIFFICULT HAS IT BEEN TO HIRE SKILLED PERSONNEL TO WORK
WITH THE TECHNOLOGIES USED IN THIS PLANT
(ESTABLISHMENT WEIGHTED)

	DB4						
	NOT ANSWERED		NOT DIFFICULT		SOME PROBLEMS		ALL
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	
IND							
1. FOOD, BEVERAGE AND TOBACCO	4	49	30	12	5	100	
2. RUBBER AND PLASTIC	9	32	25	26	7	99	
3. LEATHER, TEXTILE AND CLOTHING	13	34	27	16	10	100	
4. WOOD	7	47	23	20	4	101	
5. FURNITURE AND FIXTURE	15	17	32	36	1	101	
6. PAPER AND ALLIED PRODUCT	10	32	40	16	3	101	
7. PRINTING, PUBLISHING AND ALLIED	8	40	33	19	1	101	
8. PRIMARY METAL	1	21	38	29	11	100	
9. FABRICATED METAL PRODUCT	0	29	34	33	3	99	
10. MACHINERY	0	37	37	24	2	100	
11. TRANSPORTATION EQUIPMENT	9	27	43	19	2	100	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	2	30	42	22	4	100	
13. NON-METALLIC MINERAL PRODUCTS	3	36	39	22	-	100	
14. PETROLEUM AND CHEMICALS	10	48	28	12	2	100	
15. OTHER MANUFACTURING	2	47	27	21	3	100	
TOTAL	6	37	32	22	4	101	

TABLE 42
FOR THOSE TECHNOLOGIES IN SECTION A THAT ARE USED IN THIS
PLANT, HAVE ANY BEEN MODIFIED TO IMPROVE THEIR OUTPUT?
(ESTABLISHMENT WEIGHTED)

	OBS					
	NOT ANSWERED		YES		NO	
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	N/A PERCENT OF EST.	ALL PERCENT OF EST.
IND						
1. FOOD, BEVERAGE AND TOBACCO	4	42	11	43		100
2. RUBBER AND PLASTIC	5	34	16	44		99
3. LEATHER, TEXTILE AND CLOTHING	1	25	7	67		100
4. WOOD	3	34	14	49		100
5. FURNITURE AND FIXTURE	2	16	30	52		100
6. PAPER AND ALLIED PRODUCT		34	30	37		101
7. PRINTING, PUBLISHING AND ALLIED	1	36	14	49		100
8. PRIMARY METAL	0	53	13	34		100
9. FABRICATED METAL PRODUCT	1	30	14	55		100
10. MACHINERY	0	36	25	39		100
11. TRANSPORTATION EQUIPMENT	7	43	8	42		100
12. ELECTRICAL AND ELECTRONIC PRODUCTS	0	31	27	43		101
13. NON-METALLIC MINERAL PRODUCTS	4	24	14	58		100
14. PETROLEUM AND CHEMICALS	4	39	19	38		100
15. OTHER MANUFACTURING	2	17	15	65		99
TOTAL	2	32	15	51		100

TABLE 43

FOR GOODS OF OWN MANUFACTURE, WHAT WAS THE PERCENTAGE OF THE
VALUE OF SHIPMENTS EXPORTED FROM THIS PLANT IN THE LAST YEAR?
(SHIPMENT WEIGHTED)

	Q81						ALL PERCENT OF EST.
	NOT ANSWERED	< 50% PERCENT OF EST.	>= 50% PERCENT OF EST.	NIL PERCENT OF EST.	N/A PERCENT OF EST.		
	PERCENT	PERCENT	PERCENT	PERCENT	PERCENT		
IND							
1. FOOD, BEVERAGE AND TOBACCO	1	56	12	31	.	100	
2. RUBBER AND PLASTIC	0	66	27	7	.	100	
3. LEATHER, TEXTILE AND CLOTHING	0	56	11	33	.	100	
4. WOOD	1	33	55	11	.	100	
5. FURNITURE AND FIXTURE	.	54	22	25	.	101	
6. PAPER AND ALLIED PRODUCT	.	38	55	7	.	100	
7. PRINTING, PUBLISHING AND ALLIED	0	42	12	45	0	93	
8. PRIMARY METAL	.	58	39	3	.	100	
9. FABRICATED METAL PRODUCT	0	41	36	22	.	99	
10. MACHINERY	1	58	39	3	.	101	
11. TRANSPORTATION EQUIPMENT	.	11	67	22	.	100	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	52	41	7	.	100	
13. NON-METALLIC MINERAL PRODUCTS	.	53	18	29	.	100	
14. PETROLEUM AND CHEMICALS	5	58	20	16	0	99	
15. OTHER MANUFACTURING	0	57	16	26	.	99	
TOTAL	1	45	35	20	0	101	

TABLE 44
WHERE IS MOST OF THE RESEARCH AND DEVELOPMENT WORK DONE FOR
THIS PLANT
(SHIPMENT WEIGHTED)

	OR2						ALL PERCENT OF EST.
	NOT ANSWERED PERCENT OF EST.	CONTRACTED PERCENT OF EST.	WITHIN PERCENT OF EST.	ELSEWHERE PERCENT OF EST.	NO R&D DONE PERCENT OF EST.		
140							
1. FOOD, BEVERAGE AND TOBACCO		7	46	39	9	101	
2. RUBBER AND PLASTIC		5	45	43	8	101	
3. LEATHER, TEXTILE AND CLOTHING	0	3	60	12	24	99	
4. WOOD	0	19	33	23	25	100	
5. FURNITURE AND FIXTURE		1	63	22	14	100	
6. PAPER AND ALLIED PRODUCT		14	30	39	17	100	
7. PRINTING, PUBLISHING AND ALLIED	0	11	37	16	37	101	
8. PRIMARY METAL		4	72	20	4	100	
9. FABRICATED METAL PRODUCT		5	44	36	14	99	
10. MACHINERY	0	2	55	36	7	100	
11. TRANSPORTATION EQUIPMENT		1	17	61	21	100	
12. ELECTRICAL AND ELECTRONIC PRODUCTS		0	49	48	3	100	
13. NON-METALLIC MINERAL PRODUCTS		8	33	52	6	99	
14. PETROLEUM AND CHEMICALS	1	6	29	56	7	99	
15. OTHER MANUFACTURING	0	8	49	18	26	101	
TOTAL	0	6	39	41	14	100	

TABLE 45
WHERE IS MOST OF THE FORMAL TRAINING DONE FOR YOUR STAFF IN
THIS PLANT
(SHIPMENT WEIGHTED)

	Q83							ALL PERCENT OF EST.	
	NOT ANSWERED		PURCHASE		WITHIN		ELSEWHERE		
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.		
IND									
1. FOOD, BEVERAGE AND TOBACCO	.	21	56	18	6	101			
2. RUBBER AND PLASTIC	.	20	57	19	5	101			
3. LEATHER, TEXTILE AND CLOTHING	1	17	50	22	9	99			
4. WOOD	0	18	55	20	7	100			
5. FURNITURE AND FIXTURE	.	14	63	16	7	100			
6. PAPER AND ALLIED PRODUCT	.	28	48	19	4	99			
7. PRINTING, PUBLISHING AND ALLIED	.	27	49	19	5	100			
8. PRIMARY METAL	.	38	38	23	2	101			
9. FABRICATED METAL PRODUCT	.	25	59	10	7	101			
10. MACHINERY	.	27	52	12	9	100			
11. TRANSPORTATION EQUIPMENT	.	36	47	14	3	100			
12. ELECTRICAL AND ELECTRONIC PRODUCTS	.	19	57	20	4	100			
13. NON-METALLIC MINERAL PRODUCTS	.	20	66	13	1	100			
14. PETROLEUM AND CHEMICALS	1	37	53	8	1	100			
15. OTHER MANUFACTURING	0	12	69	8	11	100			
TOTAL	0	27	52	16	5	100			

TABLE 46
HOW DIFFICULT HAS IT BEEN TO HIRE SKILLED PERSONNEL TO WORK
WITH THE TECHNOLOGIES USED IN THIS PLANT
(SHIPMENT WEIGHTED)

	OR4												
	NOT ANSWERED		NOT DIFFICULT		SOME PROBLEMS		VERY DIFFICULT		N/A		ALL		
	PERCENT		PERCENT		PERCENT		PERCENT		PERCENT		PERCENT		
	OF EST.		OF EST.		OF EST.		OF EST.		OF EST.		OF EST.		
IND													
1. FOOD, BEVERAGE AND TOBACCO	2		36		39		20		3			100	
2. RUBBER AND PLASTIC	4		15		50		30		1			100	
3. LEATHER, TEXTILE AND CLOTHING	6		38		36		14		5			99	
4. WOOD	2		39		37		21		0			99	
5. FURNITURE AND FIXTURE	1		28		40		29		1			99	
6. PAPER AND ALLIED PRODUCT	2		26		49		20		3			100	
7. PRINTING, PUBLISHING AND ALLIED	3		44		37		15		0			99	
8. PRIMARY METAL	0		44		38		17		1			100	
9. FABRICATED METAL PRODUCT	4		20		44		31		0			99	
10. MACHINERY	1		21		53		25		1			101	
11. TRANSPORTATION EQUIPMENT	0		28		55		17		0			100	
12. ELECTRICAL AND ELECTRONIC PRODUCTS	0		16		64		20		0			100	
13. NON-METALLIC MINERAL PRODUCTS	0		33		48		18					99	
14. PETROLEUM AND CHEMICALS	2		29		48		20		1			100	
15. OTHER MANUFACTURING	2		33		48		15		2			100	
TOTAL	2		31		46		20		1			100	

TABLE 47
FOR THOSE TECHNOLOGIES IN SECTION A THAT ARE USED IN THIS
PLANT, HAVE ANY BEEN MODIFIED TO IMPROVE THEIR OUTPUT?
(SHIPMENT WEIGHTED)

	085						ALL PERCENT OF EST.
	NOT ANSWERED	YES	NO	N/A			
	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.	PERCENT OF EST.			
IND							
1. FOOD, BEVERAGE AND TOBACCO	1	58	16	26	101		
2. RUBBER AND PLASTIC	1	65	14	20	100		
3. LEATHER, TEXTILE AND CLOTHING	1	48	16	35	100		
4. WOOD	0	53	20	27	100		
5. FURNITURE AND FIXTURE	0	36	41	23	100		
6. PAPER AND ALLIED PRODUCT	1	63	29	8	100		
7. PRINTING, PUBLISHING AND ALLIED	1	51	18	31	101		
8. PRIMARY METAL	3	80	9	7	99		
9. FABRICATED METAL PRODUCT	1	58	17	23	99		
10. MACHINERY	0	58	25	17	100		
11. TRANSPORTATION EQUIPMENT	0	89	8	2	99		
12. ELECTRICAL AND ELECTRONIC PRODUCTS	0	76	17	7	100		
13. NON-METALLIC MINERAL PRODUCTS	0	56	24	20	100		
14. PETROLEUM AND CHEMICALS	3	75	11	12	101		
15. OTHER MANUFACTURING	1	47	17	35	100		
TOTAL	1	67	15	16	99		



SURVEY OF MANUFACTURING TECHNOLOGY

Statistics Act, Revised Statutes of Canada
1985, chapter S19Si vous préférez ce questionnaire en français, veuillez cocher ☐

Complete and return within 10 days after receipt

Confidential when completed

Please correct any errors in name, address and postal code

Section A - TECHNOLOGY USE						
For EACH of the manufacturing technologies listed below, mark (X) in the column that best reflects your plant's use of that technology. Refer to Definition of Terms on the attached sheet. MARK ONLY ONE COLUMN BOX FOR EACH TECHNOLOGY.	Used in operations (1)	Not currently used in operations				
		Plan to use within		No plans to use because		
		The next 2 years (2)	2 - 5 years (3)	Does not apply to operations (4)	Not cost effective (5)	Other (6)
1. DESIGN AND ENGINEERING						
(a) Computer aided design (CAD) and/or computer aided engineering (CAE)						
(b) CAD output used to control manufacturing machines (CAD/CAM)						
(c) Digital representation of CAD output used in procurement activities						
2. FABRICATION AND ASSEMBLY						
(a) Flexible manufacturing cell(s) (FMC) or systems (FMS)						
(b) NC/CNC machine(s)						
(c) Materials working laser(s)						
(d) Pick and place robot(s)						
(e) Other robots						
3. AUTOMATED MATERIAL HANDLING						
(a) Automated storage and retrieval system (AS/RS)						
(b) Automated guided vehicle systems (AGVS)						
4. AUTOMATED SENSOR BASED INSPECTION AND/OR TESTING EQUIPMENT						
(a) Performed on incoming or in process materials						
(b) Performed on final product						
5. COMMUNICATIONS AND CONTROL						
(a) Local area network for technical data						
(b) Local area network for factory use						
(c) Inter-company computer network linking plant to subcontractors, suppliers, and/or customers						
(d) Programmable controller(s)						
(e) Computer(s) used for control on the factory floor						
6. MANUFACTURING INFORMATION SYSTEMS						
(a) Materials Requirement Planning (MRP)						
(b) Manufacturing Resource Planning (MRP II)						
7. INTEGRATION AND CONTROL						
(a) Computer integrated manufacturing (CIM)						
(b) Supervisory control and data acquisition (SCADA)						
(c) Artificial intelligence and/or expert systems						

Section B - CHARACTERISTICS OF THIS ESTABLISHMENT

<p>1. For goods of own manufacture, what was the percentage of the value of shipments exported from this plant in the last year?</p> <p><input type="checkbox"/> Less than 50%</p> <p><input type="checkbox"/> 50% or more</p> <p><input type="checkbox"/> Nil</p>	<p>2. Where is most of the research and development work done for this plant?</p> <p><input type="checkbox"/> Contracted out</p> <p><input type="checkbox"/> Within this plant</p> <p><input type="checkbox"/> Elsewhere in the firm</p> <p><input type="checkbox"/> No research and development done</p>	<p>3. Where is most of the formal training done for your staff in this plant?</p> <p><input type="checkbox"/> Through purchase of training courses or seats in public or private institutions</p> <p><input type="checkbox"/> Within this plant</p> <p><input type="checkbox"/> Elsewhere in the firm</p> <p><input type="checkbox"/> No formal training provided</p>
<p>4. How difficult has it been to hire skilled personnel to work with the technologies used in this plant?</p> <p><input type="checkbox"/> Not difficult</p> <p><input type="checkbox"/> Some problems</p> <p><input type="checkbox"/> Very difficult</p>	<p>5. For those technologies in Section A that are used in this plant, have any been modified to improve their output?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Not applicable</p>	

COMMENTS

Section C - CERTIFICATION
This report is substantially accurate and has been prepared in accordance with instructions

Name of person to contact regarding this report	Signature of authorized person	
Telephone (including area code and extension) () -	Title	Date

DEFINITION OF TERMS FOR SECTION A

1. **COMPUTER-AIDED DESIGN (CAD) AND/OR COMPUTER-AIDED ENGINEERING** – Use of computers for drawing and designing parts or products for analysis and testing of designed parts or products

COMPUTER-AIDED DESIGN (CAD) COMPUTER-AIDED MANUFACTURING (CAM) – Use of CAD output for controlling machines used to manufacture the part or product

DIGITAL DATA REPRESENTATION – Use of digital representation of CAD output for controlling machines used to manufacture the part or product.

2. **FLEXIBLE MANUFACTURING CELLS (FMC)** – Machines with fully integrated material handling capabilities controlled by computers or programmable controllers, capable of single path acceptance of raw material and delivery of finished product.

FLEXIBLE MANUFACTURING SYSTEMS (FMS) – Two or more machines with fully integrated material handling capabilities controlled by computers or programmable controllers, capable of single or multiple acceptance of raw material and multiple path delivery of finished product.

NC/CNC MACHINES – A single machine either numerically controlled (NC) or computer numerically controlled (CNC) with or without automated material handling capabilities. NC machines are controlled by numerical commands, punched on paper or plastic mylar tape while CNC machines are controlled electronically through a computer residing in the machine.

MATERIALS WORKING LASER(S) – Laser technology used for welding, cutting, treating, scribing and marking.

ROBOTS – A reprogrammable, multifunctional manipulator designed to move materials, parts, tools or specialized devices through variable programmed motions for the performance of a variety of tasks

PICK AND PLACE ROBOTS – A simple robot, with one, two or three degrees of freedom, which transfers items from place to place by means of point-to-point moves. Little or no trajectory control is available

3. **AUTOMATED STORAGE AND RETRIEVAL SYSTEM (AS/RS)** – Computer-controlled equipment providing for the automatic handling and storage of materials, parts, subassemblies or finished products

AUTOMATED GUIDED VEHICLE SYSTEMS (AGVS) – Vehicles equipped with automatic guidance devices programmed to follow a path that interfaces with work stations for automated or manual loading and unloading of materials, tools, parts or products.

5. **TECHNICAL DATA NETWORK** – Use of local area network (LAN) – technology to exchange technical data within design and engineering departments.

FACTORY NETWORK – Use of local area network (LAN) technology to exchange information between different points on the factory floor

PROGRAMMABLE CONTROLLER – A solid state industrial control device that has programmable memory for storage of instructions, which performs functions equivalent to a relay panel or wired solid state logic control system.

COMPUTERS USED FOR CONTROL ON THE FACTORY FLOOR – Exclude computers imbedded within machines or computers used solely for data acquisition or monitoring. Include computers on the factory floor that may be dedicated to control, but which are capable of being reprogrammed for other functions.

6. **MATERIALS REQUIREMENTS PLANNING (MRP)** – Computer-based production management and scheduling system to control order quantities, inventory and finished goods.

MANUFACTURING RESOURCE PLANNING (MRP II) – A development of MRP for computer-based production management of machine loading and production scheduling, as well as inventory control and material handling.

7. **COMPUTER INTEGRATED MANUFACTURING (CIM)** – Totally automated production, in which all manufacturing processes are integrated and controlled by a central computer.

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) – On-line, computer-based monitoring and control of process and plant variables at a central site.

ARTIFICIAL INTELLIGENCE (AI) – The ability of a machine to learn from experience and perform tasks normally attributed to human intelligence, e.g. problem solving, reasoning, understanding natural language.

EXPERT SYSTEMS – The computerization of knowledge of experts in narrowly defined fields, such as fault finding and designing.

